USER'S GUIDE for TIPSY:

A Table Interpolation Program for Stand Yields

Version 2.0 Beta

by

K. J. Mitchell and S. E. Grout
British Columbia Ministry of Forests

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Province of British Columbia
Ministry of Forests

This interim version of TIPSY is
distributed for the purpose of testing
the system and soliciting user
comments. Please report all
problems and suggestions to
the TIPSY Coordinator:
Fax: 387-8197
Phone: 387-6718
Email: SGROUT for ALL-IN-1 or PROFS users
INTERNET: SGROUT@GALAXY.GOV.BC.CA for others

To order TIPSY 2.0ß and register as a new user:
please complete the form on the
last page of this guide.

ATTENTION EXPERIENCED USERS OF VERSION 1.01

Recent enhancements and changes
included in this new release of TIPSY
are listed in *APPENDIX 1*
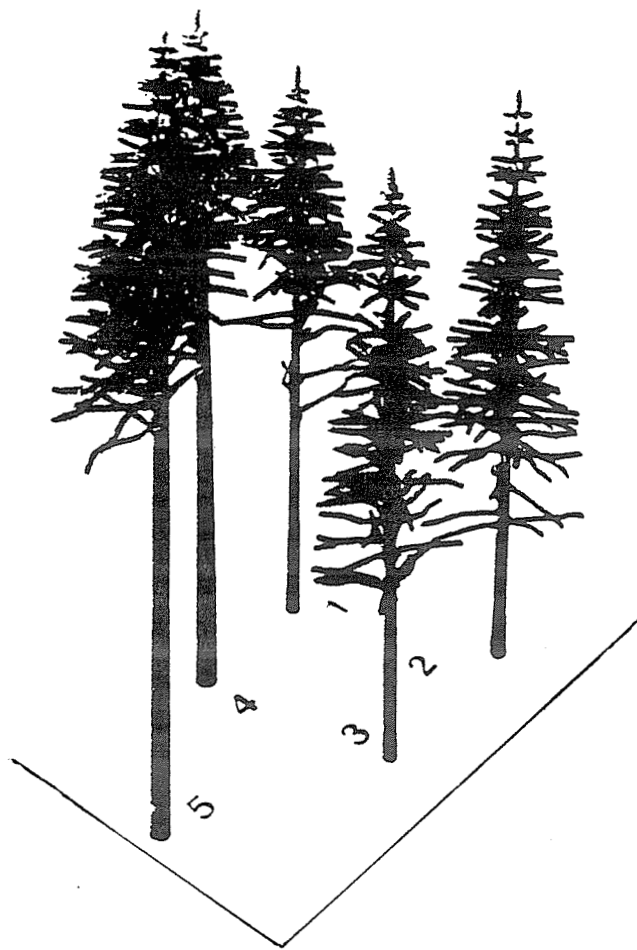
TABLE OF CONTENTS

Plate 1

INTRODUCTION

TIPSY is a Table Interpolation Program for electronically retrieving Stand Yield information traditionally available in printed reports such as the Ministry of Forests *Managed Stand Yield Tables for Coastal Douglas-fir: Initial Density and Precommercial Thinning (Mitchell and Cameron, 1985)*. TIPSY retrieves the appropriate yield tables from its database, customizes the information, and displays yield summaries in seconds.

Published yield tables are convenient for many purposes, but they are inconvenient when you need the numbers for input to other systems such as forest planning models. Furthermore, when using printed tables, you must interpolate among the tabular entries to obtain yield information corresponding to a particular treatment, site or other variable. For example, yield tables may only be available for stands planted with 1110 and 750 trees per hectare. If you need data for stands with 950 trees, you must interpolate between the two tables - a very laborious task if done by hand!

This guide supports version 2.0ß, which is the first release of TIPSY with a fully functional data base. It replaces version 1.01, a prototype distributed in May, 1991. New features are noted in *APPENDIX 1*.

The TIPSY System

The publication of yield tables for Douglas-fir in 1985 precipitated a request from Ministry planners for the development of software which would give them electronic access to the information in the published yield tables. The original software, then known as the Meta Model, was developed for the Ministry by Forest Planning Systems, now part of Reid Collins and Associates.

In 1990, RamSoft Systems Ltd. translated the program from BASIC to C and restructured it to accommodate the next generation of managed stand yield tables, and other needs of the Ministry. The most obvious change is in the interface which improves the ease and speed of operation. The program was renamed TIPSY.

The yield tables in TIPSY's database are generated by the Tree and Stand Simulator (TASS) for various even-aged coniferous species of commercial importance growing on the coast and in the interior of British Columbia. TASS is a computer model that simulates the growth of individual trees and stands in three dimensions. The physical model in Plate 1 accurately duplicates the boles and branches of five trees simulated electronically by TASS. The development of a plantation to age 45 is shown in Plates 2 to 5 including a thinning at age 37. The crowns of individual trees expand and contract asymmetrically as branch extension responds to internal growth processes, physical restrictions imposed by the crowns of competitors, environmental factors and silvicultural practices. The crowns add a shell of foliage each year that benefits the trees in diminishing amounts for several years. The volume increment produced by the foliage is distributed over the bole annually and accumulated to provide tree and stand statistics. Refer to *Mitchell and Cameron (1985)* and *Mitchell (1975)* for more information on TASS.

The Ministry of Forests will publish the yield tables in TIPSY's database later along with the corresponding stand and stock tables, summaries of mean diameter by minimum diameter limits, mean annual increment, and product and value recovery.
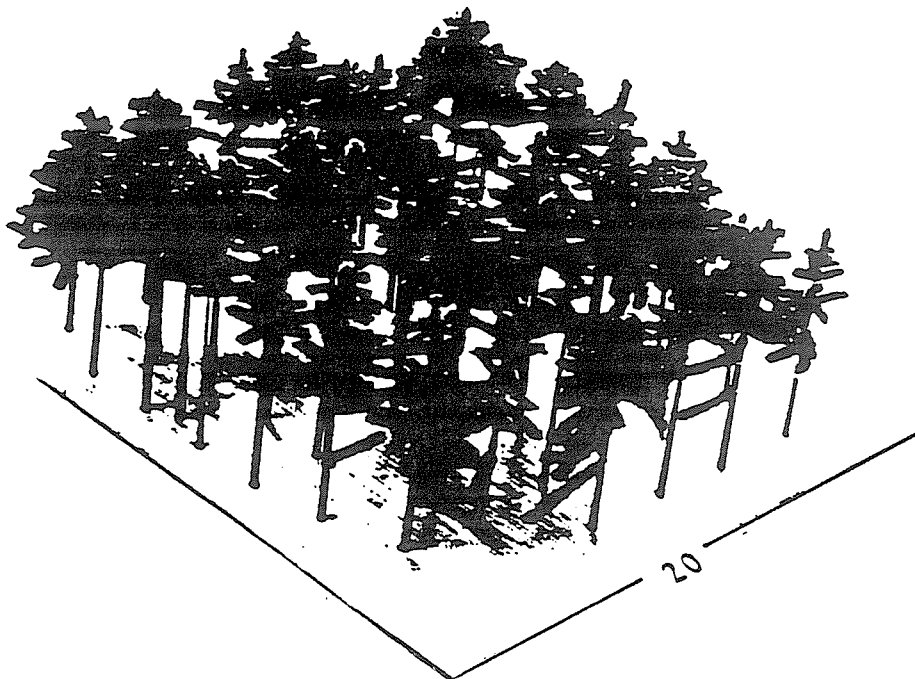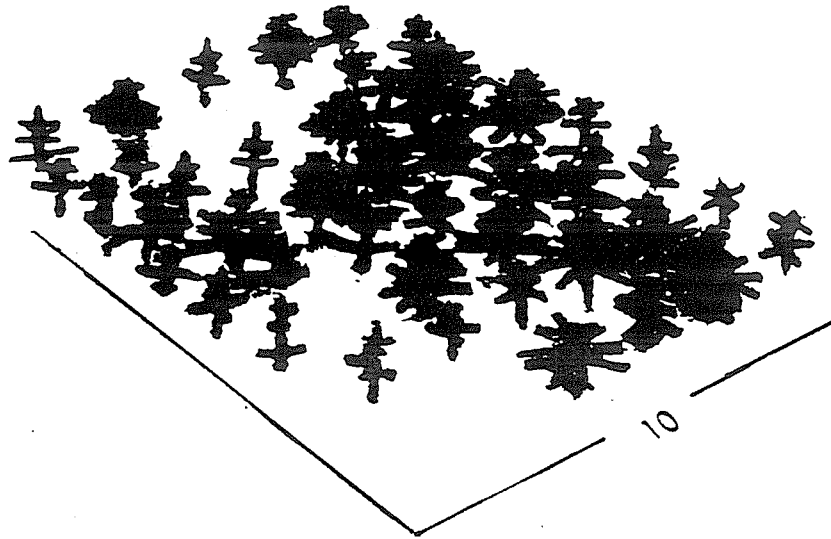
Plate 2

TIPSY or VDYP?

You can use TIPSY at the stand level for evaluating silvicultural options in <u>managed</u> <u>stands</u>, or at the forest level for timber supply analyses if applied in concert with VDYP, the Variable Density Yield Prediction system developed by Inventory Branch for <u>natural stands</u>. Note that TIPSY does address managed stands of natural origin, including the untreated controls which are needed to evaluate the response to silvicultural regimes. However, output from the two models must not be used to compare the performance of managed and natural forests at the stand level. This is because TIPSY-generated tables are based on the growth trends observed in fully stocked research plots in contrast to VDYP tables which are derived from temporary inventory plots located randomly in unmanaged stands. Please refer to *APPENDIX* 2 for more information on the appropriate application of each model. The Ministry is coordinating the development and release of these tools.

Purpose of this Guide

This guide was prepared for the benefit of silviculturists, forest planners and managers who have not used earlier versions of TIPSY. We assume that you are acquainted with personal computers, but not necessarily an experienced user. You should also be familiar with the use and application of traditional yield tables. A detailed tutorial with examples of increasing complexity is included to keep the learning time and frustration to a minimum.

The guide will also alert experienced users to recent upgrades, summarized in *APPENDIX 1*, and serve as a convenient reference manual for those who need more information about the software and database.

How to use this Guide

This guide includes a tutorial for new users, a discussion of adjustments for operational conditions, an introduction to TIPSY's database, sources of literature cited, and an appendix of supplementary information. In the tutorial, you will move through TIPSY's screens, manage files, and become comfortable with the system. Then you'll see how to take advantage of the full potential of TIPSY. The appendices contain system information, a guide to the range of yield tables available from TIPSY, and other types of support. The following is a brief description of each section.

Getting Started

- This section (page 7) tells you where to find information needed to install and operate the software, and introduces you to the yield tables available through TIPSY.

Tutorial

- *Getting Around in TIPSY* (page 11) introduces you to most of TIPSY's screens and menu options.
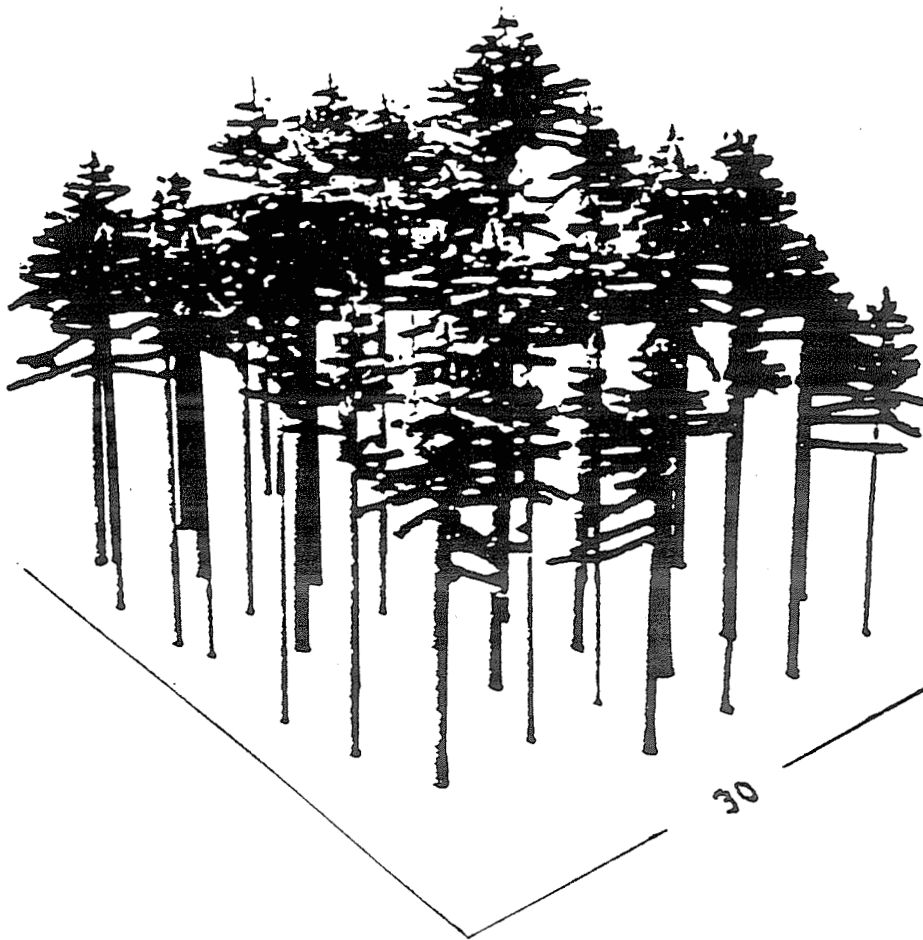
Plate 3

- *Managing Files* (page 21) explains the use of input and output files, and naming conventions.

- *Getting to Know TIPSY* (page 23) and *Taking Control of TIPSY* (page 37) take a closer look at TIPSY's options, features and embedded screens, and teaches you to produce customized yield tables and graphs.

- *Getting Serious about TIPSY* (page 41) addresses precommercial thinning and graphical overlays, and introduces Operational Adjustment Factors (OAF's).

Operational Yields

- This section (page 45) covers Operational Adjustment Factors (OAF's) that reduce yields to compensate for unproductive holes in the stands, and for losses due to pests and other agents which tend to increase in intensity as stands age.

TIPSY's Database (page 51) introduces you to the data behind TIPSY.

Literature Cited (page 54) helps you find supporting information.

APPENDIX

- *What's new in TIPSY 2.0β?* (page 57), and *TIPSY and VDYP* (page 58) will bring you up to date, and help you select the right model for the job.

- *System Requirements* (page 59), *Installation* (page 60), *Operation* (page 63), *Setup Procedures* (page 64), and *User Support* (page 65) describe the hardware and software requirements, how to install TIPSY and start it operating, alternative configurations, and who you can call for help.

- *Database* (page 66) and *Available Yield Tables* (page 67) is where you'll find a list of the yield tables and site curves, and a guide to the range of yield tables available through TIPSY.

- *Helpful Hints,* (page 68), *Error Messages* (page 70) and *Trouble Shooting* (page 71) list some of the options in TIPSY that were not covered in the tutorial, tell you where to look when TIPSY's response to improper use is not self explanatory, and where you go for help when your computer system "freezes" or displays an error message.

Glossary (page 73) and **Index** (page 74) should serve as convenient references for you.

TIPSY Registration Form (page 77) is for you to register as a TIPSY user, if you haven't already done so, and also to comment on the system. This will help you, the user, and our software developers to meet mutual needs.
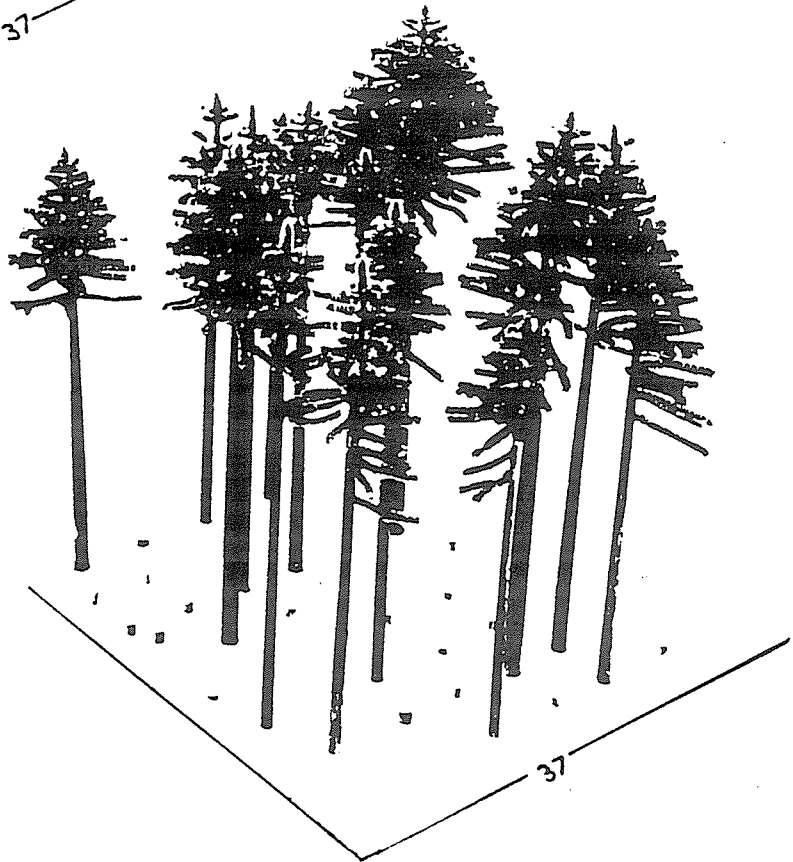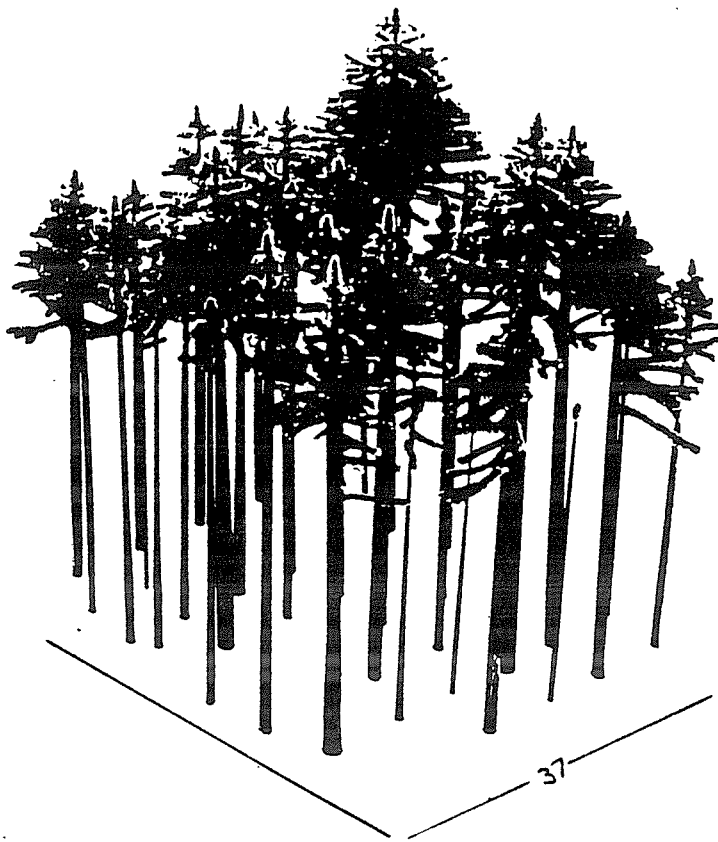
Plate 4

GETTING STARTED

TIPSY is available to managers of Crown forests in British Columbia free of charge, and to other agencies and individuals at the discretion of the Ministry of Forests. A diskette with TIPSY and supporting software is enclosed in the mailer attached to the inside back cover of this guide. If missing or the wrong size, please complete the order form on the last page and forward it to us by mail or fax. This version of TIPSY (V 2.0ß) is for interim use until thoroughly tested by resource managers.

TIPSY will run on any IBM computer or clone with a hard drive. A colour monitor is very desirable but not essential. Detailed *System Requirements* are given in *APPENDIX 3*. The program can be installed on your hard drive and activated by means of a few simple commands. Please go to *APPENDIX 4* and proceed with the installation of TIPSY. Experienced users may also want to review the operation of TIPSY (*APPENDIX 5)* and alternative setup procedures (*APPENDIX 6*). New users should return to this point in the guide.

The Research Branch can provide limited support to new users. Requests for assistance are coordinated by our TIPSY Coordinator. Please refer to *User Support* in *APPENDIX 7*.

The following information will introduce you to the type and range of yield tables available through TIPSY. It provides useful background material for the tutorial in next section of this guide.

TIPSY can generate yield tables for even-aged stands of the following species of commercial importance:

Coast
- Douglas-fir
- Western hemlock
- Western redcedar
- Sitka spruce
- Balsam (use hemlock)

Interior
- Lodgepole pine
- White spruce
- Douglas-fir
- Western hemlock (use coastal hemlock)
- Western redcedar (use coastal redcedar)

The management variables in TIPSY include species, regeneration method, establishment density, and precommercial thinning (PCT). Coastal Douglas-fir, for example, can be planted at densities ranging from 331 to 4444 trees per hectare (Table 1). Comparable intertree distances vary from 5.5 to 1.5 meters. The first line in the left-hand half of Table 1 shows that stands planted with 4444 trees (1.5 m spacing) can be precommercially thinned to as few as 331 trees (5.5 m average spacing). Note that stands planted with 4444 trees per hectare are predicted to have 4100 survivors prior to precommercial thinning. Users may select any residual density from 331 to 4100 trees, although 4100 trees is not an effective option because no trees would be removed. Thinning occurs when stands reach a height of 6 m on the coast and 4 m in the interior.
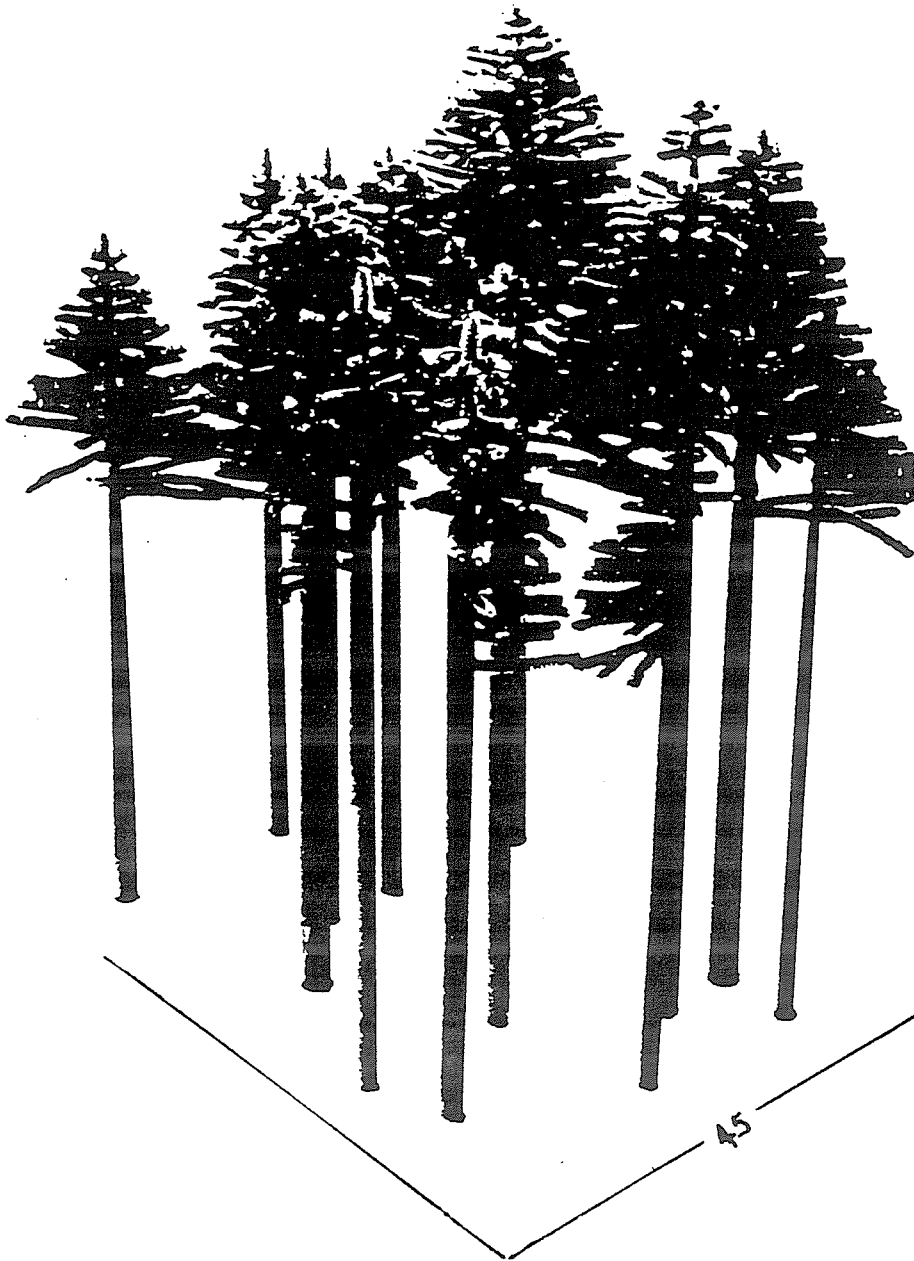
Plate 5

The next lower section of Table 1 shows that a stand of any initial density between 4443 and 2500 trees may be thinned to any residual density between 2306 and 331 trees. Other combinations of establishment and PCT densities follow. Thinning is not an option in stands established with fewer than 400 trees. Similar information for naturally regenerated stands is given in the right-hand part of Table 1. More information on TIPSY's database, and available yield tables, is given in *APPENDICES 8* and *9*, respectively.

TABLE 1. Yield tables available for coastal Douglas-fir

PLANTED STANDS[1]			NATURAL REGENERATION[1]		
Estab-lished[1]	Before PCT[2]	After PCT[1]	Estab-lished[1]	Before PCT[2]	After PCT[1]
		Number of trees			
			10000	9227]	9227 - 331
4444 (1.5)[3]	4100]	4100 - 331	9999 : 4444	9226 : 4100	4100 - 331
4443 : 2500 (2.0)	4099 : 2306	2306 - 331	4443 : 2500	4099 : 2307	2307 - 331
2499 : 1600 (2.5)	2305 : 1476	1476 - 331	2499 : 1600	2304 : 1476	1476 - 331
1599 : 1111 (3.0)	1475 : 1025	1025 - 331	1599 : 1111	1475 : 1025	1025 - 331
1110 : 816 (3.5)	1024 : 753	753 - 331	1110 : 816	1024 : 753	753 - 331
815 : 625 (4.0)	752 : 577	577 - 331	815 : 625	752 : 577	577 - 331
624 : 494 (4.5)	576 : 455	455 - 331	624 : 494	576 : 456	456 - 331
493 : 400 (5.0)	454 : 369	369 - 331	493 : 400	455 : 369	369 - 331
399 : 331 (5.5)	no PCT option		399 : 331	no PCT option	

[1] input options for TIPSY
[2] supplementary user information
[3] average intertree distance

Figure 1

```
      TIPSY - Table Interpolation Program for Stand Yields

                         V2.0 Beta

             Property of the BC Ministry of Forests
             Originally implemented as the Meta Model
          Redesigned and implemented by RamSoft Systems Ltd.
                       1990,1991,1992
        ß version - not to be distributed in part or in whole

                     All Rights Reserved


                Press any key to continue . . .
```

Figure 2

```
                                                            =P O=
                          TIPSY Main Menu


                   GET    an   input file
                   EDIT   this input file
                   SAVE   this input file
                   RUN    this input file
                   VIEW   any  yield table
                   PRINT  any  yield table
                   DRAW   any  yield curve
                   LIST   all  files
                   EXIT   from TIPSY




             CHANGE the System Database directory



                  === RETURN - make selection ===
```

TUTORIAL

The tutorial instructions assume that you have a colour monitor, although TIPSY should work on a monochrome unit if the brightness and contrast are adjusted properly.

Getting around in TIPSY

An explanation of the special *KEYWORDS* and [keystrokes] listed below will help you operate TIPSY. Note that keys (symbolized by "[ ]") may have more than one function:

GET	Retrieve an existing input file for further processing
EDIT	Change the input file
SAVE	Save the edited input file
RUN	Execute the input file and produce yield tables
VIEW	View the yield table on the screen
PRINT	Print yield tables from a previous run
DRAW	Draw a yield curve on the screen
LIST	List the files stored in a specified directory
EXIT	Leave TIPSY

[◄─┘]	"Enter/Return"	Enter text and numbers.
		Go into a lower menu.
[Esc]	"Escape"	Select an option, and show information or return to previous menu.
		Return to previous menu.
		Leave menu or information display.
[↑] [↓]	"Cursor Control"	Move up/down among major fields.[1]
[←] [→]	"Cursor Control"	Move left/right among major fields.[1]
[PgUp]	"Page Up"	Move cursor up within a field and select.[2]
[PgDn]	"Page Down"	Move cursor down within a field and select.[2]
[ ]	"Spacebar"	Insert a space or blank in text. Often used in response to "Press any key".

---

[1] The cursor is moved by means of a separate cluster of four cursor keys if present on your keyboard. Otherwise, set the [NumLock] key to cursor control (off) and use the numeric/cursor keypad to control the cursor. Enter numbers via the numeric keys positioned above the letters on the main section of the keyboard.

[2] Cursor control keys can substitute for [PgUp/PgDn] in some applications.

Figure 3

```
═══════════════════════════════════════════════════════════════════════P 1══
║                                                                           ║
║                        GET     an     input   file                        ║
║              Enter disk drive (optional) and file name:                   ║
║                                                                           ║
║                                                                           ║
║                                                                           ║
║                                                                           ║
║         DEFAULT.IN                                                        ║
║                                                                           ║
║                                                                           ║
║                                                                           ║
║                                                                           ║
║                                                                           ║
║                                                                           ║
║         Press RETURN here to:                                             ║
║         GET                                                               ║
║                                                                           ║
║                                                                           ║
║                                                                           ║
║                             ═══ ESC -   exit panel  ═══                    ║
═══════════════════════════════════════════════════════════════════════════
```

Figure 4

```
═══════════════════════════════════════════════════════════════════════P 2══
║                                                                           ║
║                          EDIT DEFAULT.IN                                  ║
║                                                                           ║
║      Project Heading                                                      ║
║      ──────────────                                                       ║
║      Dean's Bench                                                         ║
║                                                                           ║
║      Table Selection                                                      ║
║      ──────────────                                                       ║
║      Coastal Douglas-fir PLANTED at  1600.00 s/ha Untreated ▾             ║
║                                                                           ║
║      Site Index:          35.00   Delay regeneration by:      0.00 years  ║
║      Breast-height Age:   50.00   OAF1: lower yield curves by: 0.00 %     ║
║      Top Height:          35.00   OAF2: bend curves down by:   0.00 %     ║
║                                                                           ║
║      Report Yield by:             Report Range:                           ║
║      ────────────────             ─────────────                           ║
║      AGE (total)                  Start:      0.00                         ║
║      HEIGHT (site)                Stop:     120.00                         ║
║                                   Step:      20.00                         ║
║      MSYT Summary:   Yes ▾                    MAI Summary:   Yes ▾         ║
║                      No                                      No            ║
║    ═ RETURN - change ═ ESC - exit menu ═══ PgUp, PgDn - select menu item ═ ║
═══════════════════════════════════════════════════════════════════════════
```

The following example will give you an overview of TIPSY, keystroke by keystroke, with reference to the figures on the facing pages. Type the commands on the left-hand side of the page, pressing each key "sharply". The instructions assume that TIPSY has been installed in the recommended drive and directory (*C:\TIPSY*). Detailed instructions for starting TIPSY are given under *Operation* in *APPENDIX 5*. Go to TIPSY's drive ...

C: [◄—┘]

and directory ...

CD TIPSY [◄—┘]

Invoke the program ...

TIPSY [◄—┘]   [Opening Screen (Figure 1) appears]

Read the opening screen and *Press any key*, e.g. ...

[spacebar]   [*TIPSY Main Menu* (Figure 2)]

to move to TIPSY's main menu. We will take a quick look at the menus and options before going into the details of operating TIPSY. The red cursor bar is on *GET an input file*. Press ...

[◄—┘]   [*GET an input file* (Figure 3)]

to select this option. The menu which appears (Figure 3) gives you an opportunity to select any existing input file. Accept the current file, *DEFAULT.IN*, by pressing ...

[◄—┘]   [*TIPSY Main Menu* (Figure 2)]

You have returned to the main menu without making any changes. Move down and select *EDIT this input file* ...

[↓] [◄—┘]   [*EDIT* ... (Figure 4)]

which displays the contents of *DEFAULT.IN* as noted at the top of the screen. This menu allows you to prepare a new input file based on an existing file. The cursor control keys, [↓] [→] [←] [↑], move the cursor among "yellow" fields. Move down ...

[↓]

to *Coastal Douglas-fir PLANTED at* ... ▼ located under the <u>Table Selection</u> heading. The symbol "▼" at the end of the cursor bar identifies a pop-up menu which can be invoked by ...

Figure 5

```
┌──────────────────────────────────────────────────────────────P 2──┐
│                                                                    │
│                          EDIT DEFAULT.IN                           │
│                                                                    │
│  Project Heading                                                   │
│                                                                    │
│  Dean's Bench                                                      │
│  ┌──────────────────────────────────────────────────────────┐     │
│  │                    Select Yield Table                      │     │
│  │                                                            │     │
│  │  Coastal Douglas-fir ▼      PLANTED ▼   1600.00 ▼  Untreated ▼   │
│  └──────────────────────────────────────────────────────────┘     │
│  Si ┌───────Specify Species───────┐  generation by:      0.00 years│
│  Br │ Coastal Douglas-fir         │  wer yield curves by: 0.00 %   │
│  To │ Lodgepole Pine              │  nd curves down by:   0.00 %   │
│     │ Western Hemlock             │                                │
│  Re │ Sitka Spruce                │  ange:                         │
│  ── │ Western Redcedar            │  ─────                         │
│  AG │ White Spruce                │     0.00                       │
│  HE │ Interior Douglas-fir        │   120.00                       │
│     └───── ESC - exit menu ───────┘    20.00                       │
│  MSYT Summary:    Yes ▼                MAI Summary:    Yes ▼        │
│                   No                                   No           │
│                                                                    │
│══ RETURN - change ══ ESC - exit menu ═══ PgUp, PgDn - select menu item ══│
└────────────────────────────────────────────────────────────────────┘
```

Figure 6

```
┌──────────────────────────────────────────────────────────────P 2──┐
│                                                                    │
│                          EDIT DEFAULT.IN                           │
│                                                                    │
│  Project Heading                                                   │
│                                                                    │
│  Dean's Bench                                                      │
│  ┌──────────────────────────────────────────────────────────┐     │
│  │                    Select Yield Table                      │     │
│  │                                                            │     │
│  │  Coastal Douglas-fir ▼      PLANTED ▼   1600.00 ▼  Untreated ▼   │
│  └──────────────────────────────────────────────────────────┘     │
│  Site Index:          35.00   Delay r┌─ Initial Density ─┐  0.00 years│
│  Breast-height Age:   50.00   OAF1: 1 │                   │ : 0.00 %  │
│  Top Height:          35.00   OAF2: b │ Upper      4444   │   0.00 %  │
│                                       │          1600.00  │           │
│  Report Yield by:             Report  │ Lower       331   │           │
│                                       │                   │           │
│  AGE (total)                  Start:  └─ ESC - exit menu ─┘           │
│  HEIGHT (site)                Stop:    120.00                         │
│                               Step:     20.00                         │
│  MSYT Summary:    Yes ▼                MAI Summary:    Yes ▼          │
│                   No                                   No             │
│                                                                      │
│══ RETURN - change ══ ESC - exit menu ═══ PgUp, PgDn - select menu item ══│
└────────────────────────────────────────────────────────────────────┘
```

[◄─┘]

Now you can change the species, regeneration method, establishment density, and number of trees left after thinning. Press ...

[◄─┘]

[*EDIT* ... (Figure 5)]

to display a list of available species. Leave the cursor on *Coastal Douglas-fir* and escape ...

[Esc]

to view the regeneration options (*PLANTED* vs. *NATURAL*). Press ...

[Esc]

[*EDIT* ... (Figure 6)]

again to see the initial density and possible range (*331 - 4444* trees). Press ...

[Esc]

to see that the plantation is *Untreated.* Press ...

[Esc]

[*EDIT* ... (Figure 4)]

to exit the pop-up windows. Now, move up ...

[↑]

to the *Project Heading,* scan the displayed input file that will soon produce a managed stand yield table (MSYT) summary for an untreated stand of coastal Douglas-fir planted with 1600 trees per hectare on site 35. The reported yields, based on age (highlighted in yellow), range from 0 to 120 in steps of 20 years. Finally press ...

[Esc]

[*TIPSY Main Menu* (Figure 7)]

to go back to the main menu. Move down ...

[↓]

and *SAVE this input file* ...

[◄─┘]

Figure 7

```
┌────────────────────────────────────────────────────────────P  0────┐
│                                                                     │
│                         TIPSY Main Menu                             │
│                                                                     │
│                                                                     │
│                                                                     │
│                GET   an    input file                               │
│                EDIT  this  input file                               │
│                SAVE  this  input file                               │
│                RUN   this  input file                               │
│                VIEW  any   yield table                              │
│                PRINT any   yield table                              │
│                DRAW  any   yield curve                              │
│                LIST  all   files                                    │
│                EXIT  from  TIPSY                                     │
│                                                                     │
│                                                                     │
│                                                                     │
│                                                                     │
│           CHANGE the System Database directory                      │
│                                                                     │
│                                                                     │
│                ════════ RETURN - make selection ════════            │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 8

```
┌────────────────────────────────────────────────────────────P  1────┐
│                                                                     │
│                    SAVE   this input file                           │
│           Enter disk drive (optional) and file name :               │
│     ┌─────────────────────────────────────────────────────────┐     │
│     │ Enter New Value                                          │     │
│     │ TEST.IN                                                  │     │
│     └─────────────────────────────────────────────────────────┘     │
│                                                                     │
│        DEFAULT.IN                                                   │
│                                                                     │
│                                                                     │
│                                                                     │
│                                                                     │
│                                                                     │
│        Press RETURN here to:                                        │
│        SAVE                                                         │
│                                                                     │
│                                                                     │
│                                                                     │
│                                                                     │
│                ════════ ESC - exit panel ════════                   │
└─────────────────────────────────────────────────────────────────────┘
```

The screen that appears gives you an opportunity to assign a new name to your "customized" file. Move the cursor bar up to *DEFAULT.IN* and type the following input file name in the small box which appears automatically when you start typing in either upper or lower case ...

[↑] *TEST.IN* [◄⌐]   [*SAVE this input file* (Figure 8)

Use the [Shift] or [Caps Lock] key to switch between upper and lower cases. Now move down, and enter ...

[↓] [◄⌐]   [*TIPSY Main Menu* (Figure 7)]

to save the new input file and return to the main menu. Go down ...

[↓]

to *RUN this input file* and execute your run ...

[◄⌐]

A *Working...* message will flash briefly. Now move down ...

[↓]

to *VIEW any yield table* and press ...

[◄⌐]

to display the name of the default output file (*DEFAULT.OUT*) which was created automatically when you completed your run a few minutes ago. Press ...

[◄⌐]

to *VIEW* a listing of the output data. Review your managed stand yield table. The *More* — at the bottom of the screen indicates that the screen listing is incomplete. Press any key, e.g. ...

[◄⌐]

to see the remaining data. Press any key twice, e.g. ...

[Esc][Esc]   [*TIPSY Main Menu* (Figure 7)]

to skip past the previous menu and return to the main menu. Next move down past *PRINT* ... and *DRAW* ...

Figure 9

```
Volume in drive C has no label
Directory of C:\TIPSY
.               <DIR>        7-02-92    6:07p
..              <DIR>        7-02-92    6:07p
TEST      IN        2028     6-18-92    1:34p
LTYPE     EXE       7845     4-27-90    9:55a
TIPSY     EXE     244930     7-07-92    4:01p
SPECTRT   DBF      35840     5-19-92   10:51a
DEFAULT   IN        2028     6-18-92    1:37p
TIP_FILE               0     6-18-92    1:38p
YIELDTBL  DBF    1468160     5-19-92   10:51a
DEFAULT   OUT       3213     6-18-92    1:37p
DEFAULT   BAK       2028     6-17-92   10:01a

9 File(s)   11083776 bytes free

End ---
```

Figure 10

```
                                                                    =P 2=
                              EDIT TEST.IN

   Project Heading
   ─────────────────

   Dean's Bench

   Table Selection
   ─────────────────

   Coastal Douglas-fir PLANTED at  1600.00 s/ha Untreated ▾

   Site Index:           35.00   Delay regeneration by:        0.00 years
   Breast-height Age:    50.00   OAF1: lower yield curves by:  0.00 %
   Top Height:           35.00   OAF2: bend curves down by:    0.00 %

   Report Yield by:              Report Range:
   ─────────────────             ─────────────────

   AGE (total)                   Start:      0.00
   HEIGHT (site)                 Stop:     120.00
                                 Step:      20.00
   MSYT Summary:   Yes ▾                      MAI Summary:   Yes ▾
                   No                                        No

   ═ RETURN - change ══ ESC - exit menu ════ PgUp, PgDn - select menu item ═
```

[↓] [↓] [↓]

[◄⎯]
to *LIST all files* and press ...

to display a sub-menu which will allow you to change the directory name if necessary. Accept the current name (*C:\TIPSY*) by pressing ...

[◄⎯]   [Directory Listing (Figure 9)]

to see a listing of the directory which should include the input file, *TEST.IN*, you saved earlier. The order of the files and descriptive information may differ for Figure 9. Press [Esc] twice ...

[Esc] [Esc]

to skip past the previous menu and exit to the main menu. Go up ...

[↑] [↑] [↑] [↑] [↑] [↑]

to *EDIT this input file* and press ...

[◄⎯]   [*EDIT TEST.IN* (Figure 10)]

to see the *EDIT TEST.IN* screen. Notice that the information displayed is the same as when you left it earlier except the name of the file at the top of the screen has changed from *DEFAULT.IN* to *TEST.IN*. The file was renamed when you saved it earlier. Now return to the main menu, move up to *GET an input file* and enter the *GET an input file* screen ...

[Esc] [↑] [◄⎯]

Move up and change the file name, *TEST.IN*, to *DEFAULT.IN* ...

[↑] *DEFAULT.IN* [◄⎯]

and display the data in this file by pressing ...

[↓] [◄⎯] [↓] [◄⎯]   [*EDIT DEFAULT.IN* (Figure 11)]

Notice that the file name has reverted back to what was displayed originally. Return to the main menu and move up to *GET an input file* ...

[Esc] [↑]   [*TIPSY Main Menu* (Figure 2)]

We will review the use of files in TIPSY before continuing with the tutorial. Please read the following section on file management without operating TIPSY. This is recommended because the next part of the *Tutorial* assumes that the status of TIPSY has not changed.

Figure 11

```
┌──────────────────────────────────────────────────────P 2──────────┐
│                                                                     │
│                          EDIT DEFAULT.IN                            │
│                                                                     │
│   Project Heading                                                   │
│   ───────────────                                                   │
│   ▓▓▓▓▓▓▓▓▓▓▓▓▓                                                      │
│   Dean's Bench                                                      │
│                                                                     │
│   Table Selection                                                   │
│   ───────────────                                                   │
│   Coastal Douglas-fir PLANTED at  1600.00 s/ha Untreated  ▾         │
│                                                                     │
│   Site Index:          35.00   Delay regeneration by:      0.00 years │
│   Breast-height Age:   50.00   OAF1: lower yield curves by: 0.00 %  │
│   Top Height:          35.00   OAF2: bend curves down by:   0.00 %  │
│                                                                     │
│   Report Yield by:         .       Report Range:                    │
│   ────────────────                 ────────────                     │
│   AGE (total)                      Start:      0.00                  │
│   HEIGHT (site)                    Stop:     120.00                  │
│                                    Step:      20.00                  │
│   MSYT Summary:   Yes ▾                          MAI Summary:  Yes ▾ │
│                   No                                           No    │
│                                                                     │
│ ══ RETURN - change ══ ESC - exit menu ════ PgUp, PgDn - select menu item ══ │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 12

```
┌──────────────────────────────────────────────────────P 0──────────┐
│                                                                     │
│                          TIPSY Main Menu                            │
│                                                                     │
│                                                                     │
│                  ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓                                 │
│                  GET    an   input file                             │
│                  EDIT   this input file                             │
│                  SAVE   this input file                             │
│                  RUN    this input file                             │
│                  VIEW   any  yield table                            │
│                  PRINT  any  yield table                            │
│                  DRAW   any  yield curve                            │
│                  LIST   all  files                                  │
│                  EXIT   from TIPSY                                  │
│                                                                     │
│                                                                     │
│                                                                     │
│              CHANGE the System Database directory                   │
│                                                                     │
│                                                                     │
│ ═══════════════════ RETURN - make selection ═══════════════════════ │
└─────────────────────────────────────────────────────────────────────┘
```

Managing Files

An understanding of file management and naming conventions is important in TIPSY. Give each new job a descriptive name such as PINE2000 (1-8 characters) before starting. The input file with the specifications for the desired yield tables would be identified by the job name plus the ".IN" extension (e.g. PINE2000.IN). The corresponding output file containing the yield table generated by TIPSY is identified by the ".OUT" extension (e.g. PINE2000.OUT). This naming convention is recommended as a means of relating input and output files. A user, having selected "TEST" for the job name, would typically ...

GET an input file: (Figure 12) to recall a copy of an existing input file (e.g. *DEFAULT.IN*), then ...

EDIT this input file: to define a new yield table, and name the output file (e.g. change *DEFAULT.OUT* to *TEST.OUT*). Next ...

SAVE this input file: if there is a need to reuse the input file later. Use a matching name (e.g. change *DEFAULT.IN* to *TEST.IN*). Now ...

RUN this input file: to produce a customized yield table which is saved in the prenamed output file (e.g. *TEST.OUT*). If the file name is not changed in the *EDIT* option, it will overwrite the contents of the previous file (e.g. *DEFAULT.OUT*). Different names can be assigned to the two types of yield summaries available. The procedure is explained later. Next, you would select ...

VIEW any yield table: to display the yield table on the screen, or move to ...

PRINT any yield table: to print the yield table. Return to the *EDIT* screen to see that the contents of your input file, *TEST.IN*, are still displayed. The file could be altered again, and the process of running and saving repeated. Remember that a copy of *DEFAULT.IN* was displayed and changed. The original version can be requested via the *GET* option. You might now go to ...

DRAW any yield curve: and name an output file (e.g. *TEST.OUT*) from which to draw the graphical relationship of two variables (e.g. volume 17.5+ over age). It is possible to overlay graphs of the same variables from two or more yield tables if each file is identified. Should you forget the name of a file, simply ...

LIST all files: to display the contents of your current directory. You can go back and complete another job (e.g. *TEST2.OUT*), or ...

EXIT from TIPSY: and return to the DOS environment.

Figure 13

```
════════════════════════════════════════════════════════════════════P 1═══
                        GET    an    input file
              Enter disk drive (optional) and file name:



      DEFAULT.IN




      Press RETURN here to:
      GET




──────────────────────── ESC -   exit panel ═══════════════════════════════
```

Figure 14

```
════════════════════════════════════════════════════════════════════P 2═══
                         EDIT DEFAULT.IN

      Project Heading
      ─────────────
      Plant 1600
      ┌──────────────────────────────────────────────────────────┐
      │                   Select Yield Table                       │
      │   Coastal Douglas-Fir ▼     PLANTED ▼  1600.00 ▼  Untreated ▼
      Site Index:           35.00   Delay regeneration by:      0.00 years
      Breast-height Age:    50.00   OAF1: lower yield curves by: 0.00 %
      Top Height:           35.00   OAF2: bend curves down by:   0.00 %

      Report Yield by:              Report Range:
      ───────────────               ────────────
      AGE (total)                   Start:      0.00
      HEIGHT (site)                 Stop:     120.00
                                    Step:      20.00
      MSYT Summary:   Yes ▼                   MAI Summary:   Yes ▼
                      No                                     No
═══ RETURN - change ══ ESC - exit menu ═══ PgUp, PgDn - select menu item ═══
```

Getting to Know TIPSY

The remainder of the tutorial will introduce you to the options, features and screens embedded in the system.

We left the red cursor bar on *GET an input file*. Press ...

[◄—]   [*GET an input file* screen (Figure 13)]

Here you can move up and type the name of an input file from an earlier session or accept the demonstration input file (*DEFAULT.IN*). *GET* the default file and return to the main menu by pressing ...

[◄—]   [*TIPSY Main Menu* (Figure 2) is displayed]

Now move the cursor down, and enter ...

[↓] [◄—]

the *EDIT* option to display the default input file. Use the arrow keys to move around the screen to see the options and settings (yellow) which are in effect in the default file, stopping with the cursor under *Project Heading*. Type *Plant 1600* in the box which appears automatically when you start typing, and "enter" the heading to replace the original, e.g. ...

Plant 1600 [◄—]

Move the cursor down ...

[↓]

to *Table Selection*. The "▾" symbol denotes a pop-up menu which can be displayed by pressing ...

[◄—]   [Pop-up *Select Yield Table* menu (Figure 14)]

Here you might select another species, regeneration option, establishment density, or treatment. Enter the species pop-up menu and move down to *Lodgepole Pine* ...

[◄—] [↓]

The species that is under the cursor is automatically selected when you escape from this menu. Return the cursor to *Douglas-fir*, and escape to the regeneration option in this enforced sequence of menus ...

Figure 15

```
┌══════════════════════════════════════════════════════════════════P 2══════┐
│                                                                            │
│                            EDIT DEFAULT.IN                                 │
│                                                                            │
│   Project Heading                                                          │
│   ─────────────────                                                        │
│   Plant 1600                                                               │
│                                                                            │
│   Table Selection                                                          │
│   ───────────────                                                          │
│   Coastal Douglas-fir PLANTED at  1600.00 s/ha Untreated ▾                 │
│                                                                            │
│   Site Index:           25.00    Delay regeneration by:         0.00 years │
│   Breast-height Age:    50.00    OAF1: lower yield curves by:    0.00 %     │
│   Top Height:           25.00    OAF2: bend curves down by:      0.00 %     │
│                                                                            │
│   Report Yield by:               Report Range:                             │
│   ─────────────────              ─────────────                             │
│   AGE (total)                    Start:      0.00                          │
│   HEIGHT (site)                  Stop:     120.00                          │
│                                  Step:      20.00                          │
│   MSYT Summary:   Yes ▾                         MAI Summary:    Yes ▾       │
│                   No                                            No          │
└═══ RETURN - change ══ ESC - exit menu ═══ PgUp, PgDn - select menu item ═══┘
```

Figure 16

```
┌══════════════════════════════════════════════════════════════════P 2══════┐
│                                                                            │
│                            EDIT DEFAULT.IN                                 │
│                                                                            │
│   Project Heading                                                          │
│   ─────────────────                                                        │
│   Plant 1600                                                               │
│                                                                            │
│   Table Selection                                                          │
│   ───────────────                                                          │
│   Coastal Douglas-fir PLANTED at  1600.00 s/ha Untreated ▾                 │
│                                                                            │
│   Site Index:           25.00    Delay regeneration by:         0.00 years │
│   Breast-height Age:    50.00    OAF1: lower yield curves by:    0.00 %     │
│   Top Height:           25.00    OAF2: bend curves down by:      0.00 %     │
│   ┌─────────────────────────────────────────────────────P 2.2─┐           │
│   │      Print Managed Stand Yield Table to file:              │           │
│   │ DEFAULT.OUT                                                │           │
│   │                                                            │           │
│   │  with NO HEADERS            ASCII Box Characters           │           │
│   │       HEADERS               IBM PC Box Characters  │y:   Yes ▾          │
│   └──── RETURN - change value ──── ESC - exit menu ───┘     No             │
│                                                                            │
└═══ RETURN - change ══ ESC - exit menu ═══ PgUp, PgDn - select menu item ═══┘
```

[↑] [Esc]

For now, preview the remaining options (establishment density and treatment) by pressing ...

[◄─┘] [Esc] [Esc]

to progress through the pop-up menus. Move down to *Site Index:* where we will specify a value of 25 m instead of 35 m. That is, ...

[↓] *25* [◄─┘]   [*EDIT* ... (Figure 15)]

Note that the *Top Height* automatically changes to 25 because the *Breast-height Age* was preset to the index age of 50 years. Furthermore, site index will be calculated if age or height are changed. Move down ...

[↓] [↓] [↓]

to the *Report Yield by:* field where *AGE (total)* is currently selected. Press the Paging keys to change selections within these fields i.e. ...

[PgDn] [PgUp]

Note that the Page-Up/Page-Down keys allow movement among white entries within a field. Leave the selection at *AGE (total)*, i.e. years since germination. Move down ...

[↓]

to the preselected *Yes* option under *MSYT Summary:* and press ...

[◄─┘]   [Pop-up *MSYT Summary* menu (Figure 16)]

to see the pop-up (▼) menu. Here you assign a job name to the file that will store the output data from the TIPSY run to be executed shortly. Change the predefined name, *DEFAULT.OUT*, to *FIRST.OUT.*

FIRST.OUT [◄─┘]

We also need the preselected *HEADERS* above our tables, and the *IBM PC Box Characters* to draw dividing lines in the tables. Accept all selections by pressing ...

[Esc] and [↑] [→]

to exit the *MSYT Summary:* and move the cursor to the *Start:* field under *Report Range* (Figure 15). Move down and change the entry in the *Stop:* field to 100 years ...

Figure 17

```
╔══════════════════════════════════════════════════════════P 2═══╗
║                                                                 ║
║                          EDIT DEFAULT.IN                        ║
║                                                                 ║
║  Project Heading                                                ║
║  ─────────────                                                  ║
║  Plant 1600                                                     ║
║                                                                 ║
║  Table Selection                                                ║
║  ─────────────────────────────────────────────────────P 2.3──┐ ║
║  Coastal Dougl│      Print Culmination (MAI) Report to file:  │ ║
║               │  ▓▓▓▓▓▓▓▓▓▓▓                                   │ ║
║  Site Index:  │  DEFAULT.OUT                                   │ ║
║  Breast-height│  Total Standing  0.0+   N      ASCII Box Characters │
║  Top Height:  │  Total Standing  7.5+   N      IBM PC Box Characters │
║               │  Merchantable   12.5+   Y                      │ ║
║  Report Yield │  Merchantable   17.5+   N                      │ ║
║  ─────────────│  Merchantable   22.5+   N                      │ ║
║               │  Merchantable   27.5+   N                      │ ║
║  AGE (total)  │  Merchantable   32.5+   N                      │ ║
║  HEIGHT (site)│                                                │ ║
║               │  Other Utiliz.   0.0+                          │ ║
║  MSYT Summary:│                                                │ ║
║               └── RETURN - change value ──── ESC - exit menu ──┘ ║
║  ═ RETURN - change ═ ESC - exit menu ═══ PgUp, PgDn - select menu item ═║
╚═════════════════════════════════════════════════════════════════╝
```

Figure 18

```
╔══════════════════════════════════════════════════════════P 2═══╗
║                                                                 ║
║                          EDIT DEFAULT.IN                        ║
║                                                                 ║
║  Project Heading                                                ║
║  ─────────────                                                  ║
║  Plant 1600                                                     ║
║                                                                 ║
║  Table Selection                                                ║
║  ─────────────────────────────────────────────────────P 2.3──┐ ║
║  Coastal Dougl│      Print Culmination (MAI) Report to file:  │ ║
║               │  FIRST.OUT                                     │ ║
║  Site Index:  │                                                │ ║
║  Breast-height│  Total Standing  0.0+   Y      ASCII Box Characters │
║  Top Height:  │  Total Standing  7.5+   N      IBM PC Box Characters │
║               │  Merchantable   12.5+   Y                      │ ║
║  Report Yield │  Merchantable   17.5+   N                      │ ║
║  ─────────────│  Merchantable   22.5+   N                      │ ║
║               │  Merchantable   27.5+   N                      │ ║
║  AGE (total)  │  Merchantable   32.5+   N                      │ ║
║  HEIGHT (site)│                                                │ ║
║               │  Other Utiliz.  ▓20.0+▓                        │ ║
║  MSYT Summary:│                                                │ ║
║               └── RETURN - change value ──── ESC - exit menu ──┘ ║
║  ═ RETURN - change ═ ESC - exit menu ═══ PgUp, PgDn - select menu item ═║
╚═════════════════════════════════════════════════════════════════╝
```

[↓] *100* [◄─┘]

Your yield table will start at age 0 and increase in steps of 20 years to age 100. [Note: tables can be referenced to plantation age or breast-height age by typing the appropriate seedling age, or breast-height age in the *Start:* field. Details are described in *APPENDIX 10* under *Helpful Hints*]. Drop down and select *Yes* ...

[↓] [↓] [PgUp]

for the *MAI Summary:* option which constructs separate tables of Mean Annual Increment based on the volume/age ratio. The age sequence for these tables was set earlier in the Report Range fields. Enter the pop-up menu (▾) ...

[◄─┘]   [*MAI Summary* pop-up menu (Figure 17)]

As with the MSYT Summary, you are able to specify the name of the output file for the MAI Summary. For now, use *FIRST.OUT,* which is the same job name as was used earlier for the MSYT summary ...

***FIRST.OUT* [◄─┘]**

Consequently, both the MSYT and MAI summaries will be stored in the same output file (i.e. *FIRST.OUT*). Notice that separate summaries can be requested for up to 7 pre-defined utilization standards. The user may exclude trees below a particular DBH limit which may range from 0.0 to 32.5 cm. The last 5 options also deduct the volume in a 10-cm top, and 30-cm stump. One table (*12.5+*), denoted by "*Y*", has been preselected. (Any entry other than "*Y*" is interpreted as "*N*" or no.) Also request an MAI Summary for *Total Standing 0.0+* volume which does not include any merchantability deductions ...

[↓] *Y* [◄─┘]

The *Other Utiliz.* option will interpolate between the first two (*0.0 - 7.5*), or among the last five (*12.5 - 32.5*) options. Request an MAI Summary for merchantable volumes *20.0+* which means that TIPSY will have to interpolate between the tables for 17.5+ and 22.5+. That is ...

[↓] [↓] [↓] [↓] [↓] [↓] [↓] *20* [◄─┘]   [Figure 18]

Notice that you can request up to 8 MAI Summaries of various utilization limits. An *Invalid value Press ESC* error message will appear if the entry is not within an acceptable range (i.e. 0.0 - 7.5 or 12.5 - 32.5).

Escape from the *MAI Summary,* pass by the <u>*Report Range*</u> and *OAF 2* ...

Figure 19

```
╔══════════════════════════════════════════════════════════════P 2═══════╗
║                                                                          ║
║                          EDIT DEFAULT.IN                                 ║
║                                                                          ║
║    Project Heading                                                       ║
║    ───────────────                                                       ║
║    Plant 1600                                                            ║
║                                                                          ║
║    Table Selection                                                       ║
║    ───────────────                                                       ║
║    Coastal Douglas-fir PLANTED at   1600.00 s/ha Untreated ▾             ║
║                                                                          ║
║    Site Index:           25.00    Delay regeneration by:        0.00 years ║
║    Breast-height Age:    50.00    OAF1: lower yield curves by:   0.00 %   ║
║    Top Height:           25.00    OAF2: bend curves down by:     0.00 %   ║
║                                                                          ║
║    Report Yield by:               Report Range:                          ║
║    ────────────────               ────────────                           ║
║    AGE (total)                    Start:      0.00                        ║
║    HEIGHT (site)                  Stop:     100.00                        ║
║                                   Step:      20.00                        ║
║    MSYT Summary:    Yes ▾                     MAI Summary:    Yes ▾       ║
║                     No                                        No          ║
║═══ RETURN - change ══ ESC - exit menu ════ PgUp, PgDn - select menu item ═║
╚══════════════════════════════════════════════════════════════════════════╝
```

Figure 20

```
╔══════════════════════════════════════════════════════════════P 1═══════╗
║                                                                          ║
║                   VIEW any  TIPSY OUTPUT FILE                            ║
║              Enter disk drive (optional) and file name :                 ║
║                                                                          ║
║                                                                          ║
║                                                                          ║
║    FIRST.OUT                                                             ║
║                                                                          ║
║                                                                          ║
║                                                                          ║
║                                                                          ║
║    Press RETURN here to:                                                 ║
║    ▓▓▓▓▓                                                                 ║
║                                                                          ║
║                                                                          ║
║                                                                          ║
║                          ══ ESC - exit panel ══                          ║
╚══════════════════════════════════════════════════════════════════════════╝
```

[Esc] [↑] [↑] [↑] [↑] [↑]   [*EDIT* ... (Figure 19)]

.to *OAF 1.* Operational Adjustments Factors allow the user to alter the yield statistics to compensate for conditions in the operational environment that usually reduce yield (holes, pests, etc.). Otherwise, the potential yield of fully stocked stands is reported. Operational Adjustment Factors (OAF's) are discussed in a later section.
Leave OAF's set to *0.00* (i.e. request potential yields) and move up ...

[↑]

to *Delay Regeneration by:* where you can specify the number of years which elapse before satisfactory regeneration is achieved. An entry of 10, for example, means that yields expected at age 20 will not be realized until age 30. Return to the *Project Heading* ...

[↑] [↑]

Now compare the information on your screen with Figure 19. You can not leave the EDIT screen if an obvious error is detected (e.g. Site Index = 0.0). A few error messages which are not self-explanatory are described in *APPENDIX 11*. Make corrections, if necessary, and press ...

[Esc]   [*TIPSY Main Menu* (Figure 2)]

to exit to the main menu. Move down and enter ...

[↓] [◄─┘]

the *SAVE this input file* menu. Move up to *DEFAULT.IN* ...

[↑]

and save your new data file under the current job name (maximum of 8 characters) plus *.IN*. File extensions (.IN and .OUT) will help you recognize input and output files. Enter ...

FIRST.IN [◄─┘] [↓] [◄─┘]

to save the input file under its assigned name, and return to the main menu. Move down to *RUN this input file* and initiate the run i.e. ...

[↓] [◄─┘]

A *Working* .... message will flash briefly. Move down to *VIEW any yield table* and enter ...

[↓] [◄─┘]   [*VIEW any yield table* (Figure 20)]

the *VIEW any yield table* menu. It gives you the option of selecting any file for viewing. Accept the name, *FIRST.OUT*, assigned to your MSYT Summary earlier, by pressing ...

Figure 21

```
PRODUCT : Managed Stand Yield Summary        SOURCE  : TASS v2.05.00 May 1/92
AGENCY  : MOF Research Branch                 VERSION : TIPSY V2.0 Beta
PROJECT : Plant 1600                          DATE    : Jul 08/92; 09:13:04

SPECIES : Coastal Douglas-fir                 SITE    : 25 m @ bh age 50
REGEN   : Planted                             DELAY   :  0 years
DENSITY : 1600 trees/ha
TREAT.  : Untreated                           FILE    : FIRST.OUT
```

OAFs 1&2:   0.00%   0.00%   (Operational Adjustment Factors)

Cumulative production

Tot Age yrs	Volume (m3/ha)								BA (m2)	MEAN DBHg (cm)	STEM CNT /ha	CC (%)	250 Prime12.5+		
	Gross 0.0	Total 0.0	7.5	Merchantable 12.5	17.5	22.5	27.5	32.5					MRCH Vol.	DBHg (cm)	LC (%)
0	0	0	0	0	0	0	0	0	0	0.0	1600	0	0	0.0	0
20	18	17	12	0	0	0	0	0	6	7.3	1455	80	0	7.3	38
40	223	221	221	184	137	42	4	0	33	17.4	1404	100	67	23.1	57
60	430	427	427	385	354	285	178	75	51	22.2	1328	100	169	31.6	45
80	618	610	610	566	538	483	404	302	65	26.0	1219	100	290	38.5	41
100	759	740	740	697	675	624	557	474	72	28.9	1101	100	395	43.0	39

More ---

```
PRODUCT : Mean Annual Increment Summary       SOURCE  : TASS v2.05.00 May 1/92
AGENCY  : MOF Research Branch                 VERSION : TIPSY V2.0 Beta
PROJECT : Plant 1600                          DATE    : Jul 08/92; 09:13:05

SPECIES : Coastal Douglas-fir                 SITE    : 25 m @ bh age 50
REGEN   : Planted                             DELAY   :  0 years
DENSITY : 1600 trees/ha
TREAT.  : Untreated                           FILE    : FIRST.OUT
```

OAFs 1&2:   0.00%   0.00%   UTILIZ : Total Standing 0.0+
MAX MAI :   7.6 m3/ha @   80 years

Tot Age (Yrs)	Top Ht (m)	Vol /ha (m3)	MAI /ha (m3)
0.0	0.0	0	0.0
20.0	7.7	17	0.9
40.0	18.2	221	5.5
60.0	25.2	426	7.1
80.0	30.1	610	7.6
100.0	33.7	740	7.4

More ---

[◄⸺⏌]   [*MSYT Summary* (Figure 21)]

                                    to see the upper part of the yield table requested earlier. Examine the
                                    three sections of header data above the table. The first 3 lines (part 1)
                                    provide the background information including the description of the run
                                    (PROJECT) entered by the user. Part 2 (4 lines) displays the status of
                                    each variable, and the name of the corresponding output file. Part 3 (1
                                    line) gives the operational adjustment factors. Note that the content of
                                    the yield table is affected only by the data in parts 2 and 3 of the header.
                                    Press any key e.g. ...

[spacebar]

                                    to see the first appended *Mean Annual Increment Summary* for *Total
                                    Standing 0.0+* which is also shown in the lower part of Figure 21. Pay
                                    particular attention to the maximum mean annual increment and the
                                    corresponding culmination age (*MAX MAI: 7.6 m³/ha @ 80 years*)
                                    displayed prior to the listing of total age, top height, volume and mean
                                    annual increment. The maximum MAI is selected from the calculations
                                    performed at each age step requested. Consequently, the age sequence
                                    can affect the resolution of MAI. The maximum mean annual increment
                                    and culmination age will be reported even if the range of ages requested
                                    in your MAI summary does not <u>reach</u> the culmination age (i.e. TIPSY
                                    generates additional age steps internally). Press the space bar three times
                                    to scan through the remaining MAI Summaries, and [Esc] twice ...

[spacebar] [spacebar] [spacebar] and [Esc] [Esc]

                                    to recall the main menu. Move down and enter ...

[↓] [◄⸺⏌]
                                    the *PRINT any yield table* option. The name of any output file can be
                                    entered - but for now accept *FIRST.OUT* and send it to the printer
                                    (assuming one is connected and "on line") by pressing ...

[◄⸺⏌]   [*Managed Stand Yield Table* (Figure 21)]

                                    The printed table should be identical to the Managed Stand Yield
                                    summary and Mean Annual Increment Summaries in Figure 21 except the
                                    date and time will be current. Congratulations if they agree. If not,
                                    compare your header information (Parts 2 and 3) with the corresponding
                                    items (SPECIES, REGEN, DENSITY, TREAT, SITE, DELAY, FILE,
                                    OAF's) in Figure 21. Return to the section on *Getting to Know TIPSY* if
                                    the error is serious. Escape ...

[Esc]   [*TIPSY Main Menu* (Figure 2)]

                                    to the main menu.

Figure 22

```
╔══════════════════════════════════════════════════════════════════P 3══╗
║                                                                        ║
║                       DRAW   any  yield curve                          ║
║                                                                        ║
║   Title                                                                ║
║   ─────                                                                ║
║   Douglas-fir planted with 1600 trees                                  ║
║                                                                        ║
║     Tipsy File     Y Axis            Y Range:      X Axis    X Range:   ║
║     ─────────      ──────            ────────      ──────    ────────   ║
║   1.FIRST.OUT    VOL(gross) 0.0▾    0 to 1000m**3  AGE▾      0 to  100yrs║
║   2.           ┌───────────────────┐                                   ║
║   3.           │   Y Axis          │                                   ║
║   4.           │   ──────          ┌────────────────┐                  ║
║   5.           │ VOL(gross) 0.0    │ Merch. Volume  │                  ║
║   6.           │ VOL(total) 0.0▾   │ ─────────────  │                  ║
║                │ MERCH VOL 12.5▾   │                │                  ║
║                │ BASAL AREA        │    12.5        │                  ║
║                │ MEAN DBHg         │    17.5        │                  ║
║                │ STEM COUNT        │    22.5        │                  ║
║                │ CROWN COVER       │    27.5        │                  ║
║                │ PRIME VOL         │    32.5        │                  ║
║                │ PRIME DBHg        └────────────────┘                  ║
║                │ PRIME LIVE CROWN  │                                   ║
║ ═══ RETURN - cha└───────────────────┘u ═══ PgUp, PgDn - select menu item═║
╚════════════════════════════════════════════════════════════════════════╝
```

Figure 23

Douglas-fir planted with 1600 trees
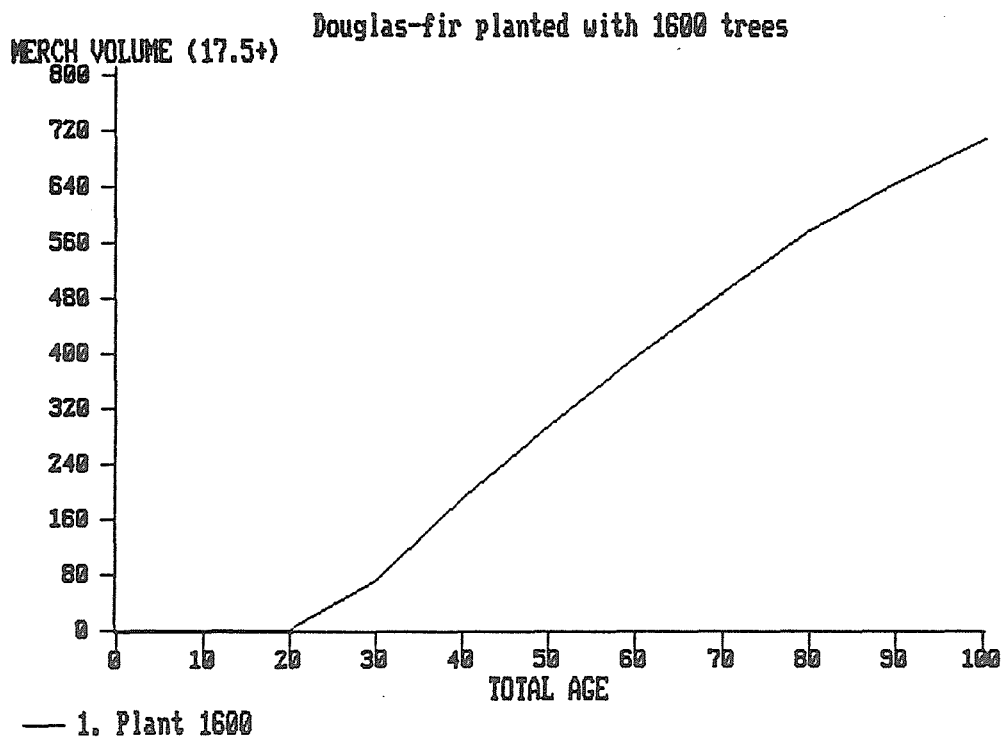
Next construct a graph of merchantable volume (17.5+) over age using data from the yield table saved as *FIRST.OUT* (Figure 21). Move down and enter ...

[↓] [◄─┘]

the *DRAW any yield curve* menu. Give your graph a title, e.g. ...

Douglas-fir planted with 1600 trees [◄─┘]

Move down to the first field under *Tipsy File* and enter the name of the file which contains the data to be graphed. That is, ...

[↓] *FIRST.OUT* [◄─┘]

Move to the field under *Y Axis,* where *VOL(gross) 0.0* (gross volume) is currently selected, and display the pop-up menu which gives you a choice of variables ...

[→] [◄─┘]

Go down to *MERCH VOL 12.5*▼ and recall the pop-up menu which allows you to change the merchantability limit ...

[↓][↓] [◄─┘]   [*DRAW any yield curve* (Figure 22)]

Move down, select *17.5*, and go right to the first of two fields in which you specify the range of the values to be displayed vertically along the Y (i.e. MERCH VOL 17.5) axis ...

[↓] [◄─┘] [→]

Leave the lower limit set to *0*, but change the upper limit to *800* cubic meters for merchantable volume ...

[→] *800* [◄─┘]

The X axis in the next field is already set to AGE (as opposed to HEIGHT). Leave the *X Range* at 0 - 100 years. Move down to *DRAW TO SCREEN*, and display the graph ...

[↓] [◄─┘]   [Graph of volume over age (Figure 23)]

Lastly, press the Print Screen [PrtSc] key if your system is configured to print graphs (see *APPENDIX 4*).

Figure 24

```
                                                                    =P 1=
                              LIST   all   files
                  Enter directory name (default : current drive) :



C:\TIPSY




Press RETURN here to:
LIST




                            === ESC - exit panel ===
```

Figure 25

```
        Directory of   C:\TIPSY

        DEFAULT   OUT      1698     6-18-92    1:11p
        TEST      IN       2028     6-18-92    1:11p
        SPECTRT   DBF     35840     5-19-92   10:51a
        YIELDTBL  DBF   1468160     5-19-92   10:51a
        DEFAULT   IN       2028     6-18-92    1:05p
        LTYPE     EXE      7845     4-27-90    9:55a
        FIRST     IN       2028     6-18-92    2:38p
        FIRST     OUT      4631     6-22-92   10:45a
        TIPSY     EXE    244930     7-07-92    4:01p
        TIP_FILE              0     6-22-92   10:57a
        DEFAULT   BAK      2028     6-18-92    1:28p
```

Press any key to return to the main menu e.g. ...

[spacebar]   **NOTE:** `If you pressed [PrtSc], the computer will not respond until the graph has been sent to the printer. This will take 1 - 2 minutes.`

Any variable in the Managed Stand Yield Summary can be graphed over age or height. Later, you will learn how to overlay graphs from different yield tables. It is not possible for TIPSY to graph information from the Mean Annual Increment Summary. Now go down to *LIST all files*, and enter ...

[↓] [◄⎯]   [*LIST all files* (Figure 24)]

the screen which allows you to change the source directory of the listing. Accept the current directory (e.g. C:\TIPSY) by pressing ...

[◄⎯]   [*Directory Listing* (Figure 25)]

which flashes *Working* .... before listing all the files in the directory, including input and output files. Ignore the program and support files (TIPSY.EXE, YIELDTBL.DBF, SPECTRT.DBF, LTYPE.EXE, TIP_FILE). They will not be confused with user files if the .IN and .OUT conventions are followed. Your *FIRST.OUT* file should be listed. Press any key to retreat to the *LIST all files* menu e. g. ...

[Esc]   [*LIST all files* (Figure 24)]

Move up to the directory name, *C:\TIPSY*, and type ...

[↑] **.IN* [◄⎯] [↓] [◄⎯]

to list only those files with the ".IN" extension. Use "*.OUT" to list output files. Press [Esc] twice to return to the main menu ...

[Esc] [Esc]   [*TIPSY Main Menu* (Figure 2)]

The *CHANGE the System Database directory* item at the bottom of the screen is a special option of limited use. It is explained in *APPENDIX 6.* To leave TIPSY, move down to *EXIT from TIPSY* and press Enter ...

[↓] [◄⎯]

which returns you to the DOS Prompt (*C:\TIPSY*). From here you can perform other functions. Try deleting the file *FIRST.OUT* ...

DEL FIRST.OUT [◄⎯]

Figure 26

```
                                                                      ═P 1═
                            GET    an    input file
                   Enter disk drive (optional) and file name:




       FIRST.IN




       Press RETURN here to:
       GET




                         ═══ ESC - exit panel ═══
```

Figure 27

```
                                                                      ═P 2═
                            EDIT FIRST.IN

   Project Heading
   ─────────────────
   Plant 1600

   Table Selection
   ─────────────────
   Coastal Douglas-fir PLANTED at  1600.00 s/ha Untreated ▾

   Site Index:          25.00    Delay regeneration by:        0.00 years
   Breast-height Age:   50.00    OAF1: lower yield curves by:  0.00 %
   Top Height:          25.00    OAF2: bend curves down by:    0.00 %

   Report Yield by:              Report Range:
   ─────────────────             ─────────────
   AGE (total)                   Start:      0.00
   HEIGHT (site)                 Stop:     100.00
                                 Step:      20.00
   MSYT Summary:   Yes ▾                        MAI Summary:   Yes ▾
                   No                                          No

     ═══ RETURN - change ══ ESC - exit menu ═══ PgUp, PgDn - select menu item ═══
```

Taking Control of TIPSY

Now it's time to complete an entire run without the help of detailed instructions. For experience, assume you need to project the yield of a stand of interior lodgepole pine on "Coyote Flats" expected to regenerate naturally with 5,000 stems per hectare following logging. No thinning is contemplated. Stands with a top height of 15 m and a breast-height age of 30 years have been observed on comparable sites. A regeneration delay of 2 years is appropriate for these conditions. Report yields every 10 years for a period of 100 years starting at the time of germination. Generate a managed stand yield table, and a summary of mean annual increment, with descriptive headings above each. The latter table should have a minimum diameter limit of 12.7 cm (5 inches).

Leave the DOS world (*C:\TIPSY*) and return to TIPSY ...

TIPSY [◄─┘]

As before, skip past the opening screen to the Main Menu, select *GET an input file*, and recall your old file by typing *FIRST.IN* in place of *DEFAULT.IN* (Figure 26). Should you get into this menu or a similar one accidentally, simply press [Esc] to ignore any changes and return to the main menu. For now, move down to the *GET* option and "return" to the main menu.

Now *EDIT ...* your *FIRST.IN* file (Figure 27) to fulfil the request outlined above. Flip back to the section entitled *Getting to Know TIPSY* if you forget the occasional keystroke. The following list summarizes the relevant information:

▪ Project Heading	Coyote Flats
▪ Species	Lodgepole pine
▪ Regeneration	Natural
▪ Initial density	5000 trees
▪ Treatment	Untreated
▪ Breast-height age	30 years
▪ Top height	15 meters
▪ Regeneration delay	2 years
▪ Reporting variable	Age
▪ Report range: Start	Germination
Stop	100 years after germination
Step	10 years

Figure 28

```
                                                                            =P 2=
  ===========================================================================
                              EDIT FIRST.IN

      Project Heading

      Coyote Flats

      Table Selection

      Lodgepole Pine NATURAL at   5000.00 s/ha Untreated ▼

      Site Index:            20.71  Delay regeneration by:        2.00 years
      Breast-height Age:     30.00  OAF1: lower yield curves by:  0.00 %
      Top Height:            15.00  OAF2: bend curves down by:    0.00 %

      Report Yield by:              Report Range:

      AGE (total)                   Start:      2.00
      HEIGHT (site)                 Stop:     102.00
                                    Step:      10.00
      MSYT Summary:    Yes ▼                        MAI Summary:    Yes ▼
                       No                                           No

  ====== RETURN - change === ESC - exit menu ==== PgUp, PgDn - select menu item ====
```

Figure 29

```
PRODUCT : Managed Stand Yield Summary       SOURCE  : TASS v2.05.00 May 1/92
AGENCY  : MOF Research Branch                VERSION : TIPSY V2.0 Beta
PROJECT : Coyote Flats                       DATE    : Jun 22/92; 13:04:14

SPECIES : Lodgepole Pine                     SITE    : 21 m @ bh age 50
REGEN   : Natural                            DELAY   :   2 years
DENSITY : 5000 trees/ha
TREAT.  : Untreated                          FILE    : COYOTE.MSY

OAFs 1&2:   0.00%    0.00%   (Operational Adjustment Factors)
Cumulative production
```

| Tot | Volume (m3/ha) | | | | | | | | BA | MEAN DBHg | STEM CNT | CC | 250 Prime 12.5+ | | |
Age yrs	Gross 0.0	Total 0.0	7.5	12.5	17.5	22.5	27.5	32.5	(m2)	(cm)	/ha	(%)	MRCH Vol.	DBHg (cm)	LC (%)
2	0	0	0	0	0	0	0	0	0	0.0	5000	0	0	0.0	0
12	1	1	0	0	0	0	0	0	0	0.3	4769	29	0	0.0	0
22	26	26	15	1	0	0	0	0	10	5.3	4330	92	1	12.9	87
32	106	103	96	49	11	1	0	0	25	9.8	3371	99	22	17.4	67
42	208	203	198	151	85	21	2	0	37	13.6	2513	100	52	21.9	53
52	299	287	286	243	185	84	19	2	43	16.5	1992	100	86	25.0	47
62	389	367	367	330	283	172	62	12	47	19.2	1628	100	121	27.7	43
72	464	427	427	396	360	252	119	33	50	21.5	1362	100	153	29.6	41
82	528	478	478	450	425	324	179	63	51	23.4	1194	100	182	31.2	39
92	582	522	522	495	478	387	238	97	53	24.8	1101	100	206	32.5	38
102	631	556	556	529	517	440	294	135	54	26.0	1020	100	229	33.5	37

```
**(part of header of MAI Summary deleted for brevity)
TREAT.  : Untreated                          FILE    : COYOTE.MAI
OAFs 1&2:      0.00%     0.00%               UTILIZ  : Merchantable 12.7+
MAX MAI :    5.5  m3/ha @     72 years
```

Tot Age (Yrs)	Top Ht (m)	Vol /ha (m3)	MAI /ha (m3)
2.0	0.0	0	0.0
12.0	2.0	0	0.0
22.0	7.1	0	0.0
32.0	11.9	47	1.5
42.0	15.7	148	3.5
52.0	18.8	240	4.6
62.0	21.2	328	5.3
72.0	23.1	395	5.5
82.0	24.7	449	5.5
92.0	25.9	494	5.4
102.0	27.0	528	5.2

▪ Managed stand yield summary

Output file	COYOTE.MSY[3]
Headers	Yes
Box characters	ASCII

▪ Mean annual increment summary

Output file	COYOTE.MAI[3]
Diameter limit	12.7+ (cancel all other limits)
Box characters	ASCII

Pay particular attention to the following:

▪ Site data: enter age and height, and let TIPSY calculate site index. If known, it could be entered alone in the field for site index.

▪ Report range: you want the yield reports to coincide with a specific number of years since germination - not since age 0. (i.e. 2, 12, 22, ..., 102 instead of 0, 10, 20, ..., 100).

▪ Yield table summaries: IBM or ASCII box characters can outline the tables. You will discover which set is most appropriate for your system after viewing and printing the tables. Specifying the type of box character in the MSYT Summary automatically assigns the same type to the MAI Summary, and vice versa. See *APPENDIX 10, Helpful Hint #4.*

When finished, compare your input screen with the one in Figure 28. If not identical, track down and correct all discrepancies.

Escape to the main menu and *SAVE* the revised input file under the name of *COYOTE.IN*. *RUN* the input file. Now *VIEW* the output file for the MSYT Summary. Note that the name you assigned to the MSYT Summary in the input file is preselected (i.e. *COYOTE.MSY*) in the VIEW screen. Compare this table with the one in Figure 29. They should be the same except for the date. *PRINT* the yield table, and then repeat the run using IBM box characters. Make a note of the character set that looks best on your system.

Now look at your *MAI Summary* table for trees 12.7+ cm which was saved as *COYOTE.MAI*. Notice that the stand achieved its maximum MAI of 5.5 m³ at 72 years (see lower part of Figure 29). This age is more accurate than can be determined from the table which shows both 72 and 82 years as potential culmination ages. Note that the exact culmination age of maximum MAI will likely occur between age 72 and 82. This could be confirmed by running TIPSY in one year steps from 72 to 82 years. Try it, and you will discover the maximum MAI at 76 years. However, you will be engaging in superfluous precision!

---

[3]Note that the earlier convention of using an ".OUT" extension to identify output files has been enhanced. We now recognize the two types of yield tables by the ".MSY" and ".MAI" extensions. This allows more flexibility when naming files, and will become necessary as more and more yield tables are generated. See *Helpful Hint #2* in *APPENDIX 10.*

Figure 30

```
                                                                    P 2
  ┌─────────────────────────────────────────────────────────────────────┐
  │                          EDIT 1600.IN                                 │
  │                                                                       │
  │  Project Heading                                                      │
  │  ─────────────                                                        │
  │  Plant 1600 - Thin to 816                                             │
  │  ┌──────────────────────────────────────────────────────────────┐    │
  │  │                    Select Yield Table                          │    │
  │  │                                                                │    │
  │  │   Coastal Douglas-fir ▼     PLANTED ▼   1600.00 ▼  Untreated ▼  │    │
  │                                                                       │
  │  Site Index:            25.00   Delay regeneration ┌ Thinned Density  │ars
  │  Breast-height Age:     50.00   OAF1: lower yield c │
  │  Top Height:            25.00   OAF2: bend curves d │ Upper      1476  │
  │                                                     │            1476.00│
  │  Report Yield by:               Report Range:      │ Lower       331  │
  │  ─────────────                  ────────────       │                  │
  │  AGE (total)                    Start:     0.00    └─ ESC - exit menu ─┘
  │  HEIGHT (site)                  Stop:    100.00                        │
  │                                 Step:     20.00                        │
  │  MSYT Summary:    Yes ▼                     MAI Summary:    Yes ▼       │
  │                   No                                        No         │
  └═══ RETURN - change ══ ESC - exit menu ═══ PgUp, PgDn - select menu item ═══┘
```

Figure 31

Plant 1600 vs. Plant 1600 & Thin to 816

BASAL AREA (y-axis, 0 to 100) vs. TOTAL AGE (x-axis, 0 to 100)

— 1. Plant 1600
-- 2. Plant 1600 - Thin to 816

Getting Serious about TIPSY

Now that you are familiar with the intricacies of TIPSY, compare the yield information for the stand described by *FIRST.IN* (Figure 27) with an identical stand which has been precommercially thinned to 816 trees per hectare (3.5-m spacing). All thinnings of coastal and interior species are performed by TIPSY when stands reach heights of 6 and 4 m, respectively.

Start by regenerating the table for the unspaced stand which was deleted earlier. Recall *FIRST.IN*, change the name of the name of the *MSYT Summary* file to *1600.MSY*, cancel the *MAI Summary*, *SAVE* the input file as *1600.IN*, and complete the run for the untreated stand.

Return to the EDIT screen, customize the *Project Heading* (e.g. *Plant 1600 - Thin to 816*), and select the fourth option under *Table Selection*. The pop-up menu offers you a choice of *Untreated* or *Thinned*. The latter brings up a sub-menu which shows the range of residual thinning densities (*331 - 1476* trees) available for the regime defined in terms of species, regeneration method and initial density (Figure 30). Note that the preselected value (*1476*) is at the upper limit of the range i.e. the number of trees alive before thinning. Selection of this residual density is possible, but will produce the same results as the *Untreated* option. Request a *Thinned Density* of *816* trees, rename the MSYT Summary *1600T816.MSY*, *SAVE* the input file as *1600T816.IN*, and execute the run. You have now generated yield tables for both the unspaced (1600.MSY) and spaced (1600T816.MSY) plantations. Let's preview some of the relationships graphically before viewing and printing the yield tables.

Start by drawing a graph of basal area over age with the curves for the unspaced and spaced stands appearing on the same graph. Select *DRAW any yield curve* on the main menu, enter the title (e.g. *Plant 1600 vs. Plant 1600 & Thin to 816*), and the names of the two TIPSY files to be overlaid (i.e. *1600.MSY* and *1600T816.MSY*), followed by the variables to be plotted (i.e. *BASAL AREA* and *AGE*) and corresponding default ranges. *DRAW* the graph and compare the results with Figure 31. Notice that the line codes (colour and pattern) are defined near the bottom of the graph. Try graphing diameter and other variables of interest. Smaller age steps will produce smoother curves. Try diameter over age after re-running the input files in 10-year steps to age 200 (Figure 32). A total of 15 variables can be displayed in relation to age. Note that for each variable you select, a default range for that variable automatically appears. *PRINT* one of the graphs if you have this capability. Simply press the *[PrtSc]* and *[spacebar]* keys in sequence, and then wait for about a minute until the main menu appears.

For additional experience, try redrawing Figure 32 in relation to height instead of age. It is not possible to change the selection from age to height in the DRAW option because the underlying yield tables (1600.MSY and 1600T816.MSY) are based on age. Try it, and read the error message which appears when you attempt to *DRAW* the graph. You must *GET 1600.IN*, enter *EDIT* and *Report Yield by: HEIGHT* in steps of 3 meters, stopping at 50 meters. Rename the MSYT Summary file *1600H.MSY*, *SAVE* the input file as *1600H.IN*, and *RUN*. Now repeat the procedure for the thinned plot using *1600H816.IN* and *1600H816.MSY* for file names. Then go to the *DRAW* option and select *HEIGHT* for the X axis and *MEAN DBHg* for the Y axis. Graph the relationship of diameter over height based on *1600H.MSY* and *1600H816.MSY*, and compare the image with Figure 33. It is possible to overlay a maximum of 6 curves on a single graph.

Figure 32

Plant 1600 vs. Plant 1600 & Thin to 816

— 1. Plant 1600
-— 2. Plant 1600 – Thin to 816
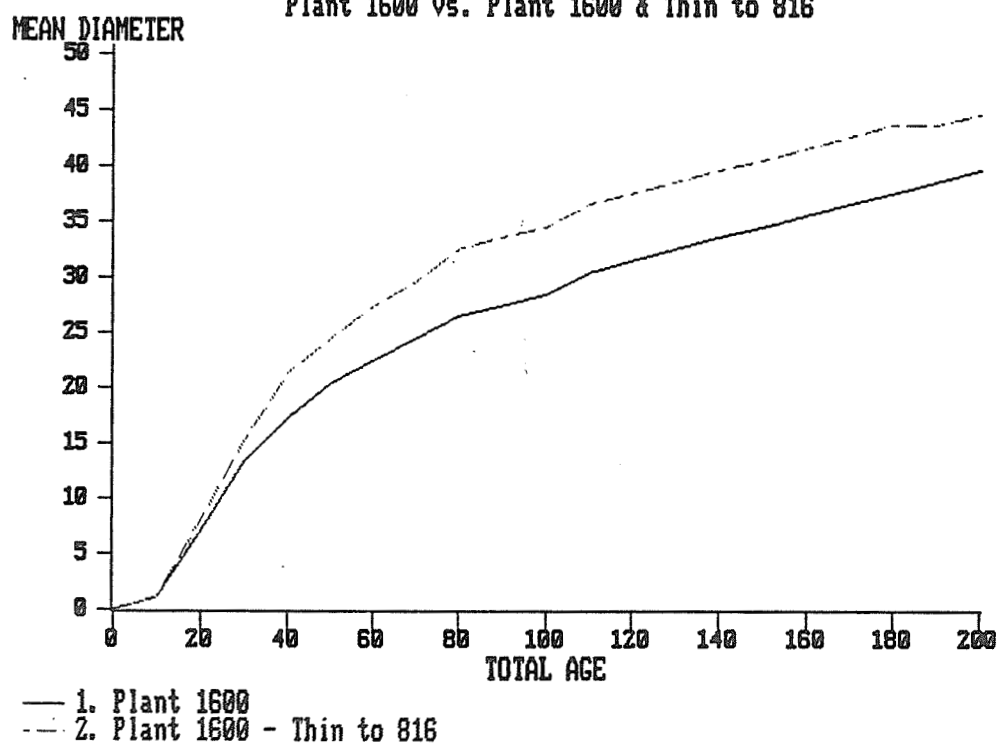
Figure 33

Plant 1600 vs. Plant 1600 & Thin to 816

— 1. Plant 1600
-— 2. Plant 1600 – Thin to 816
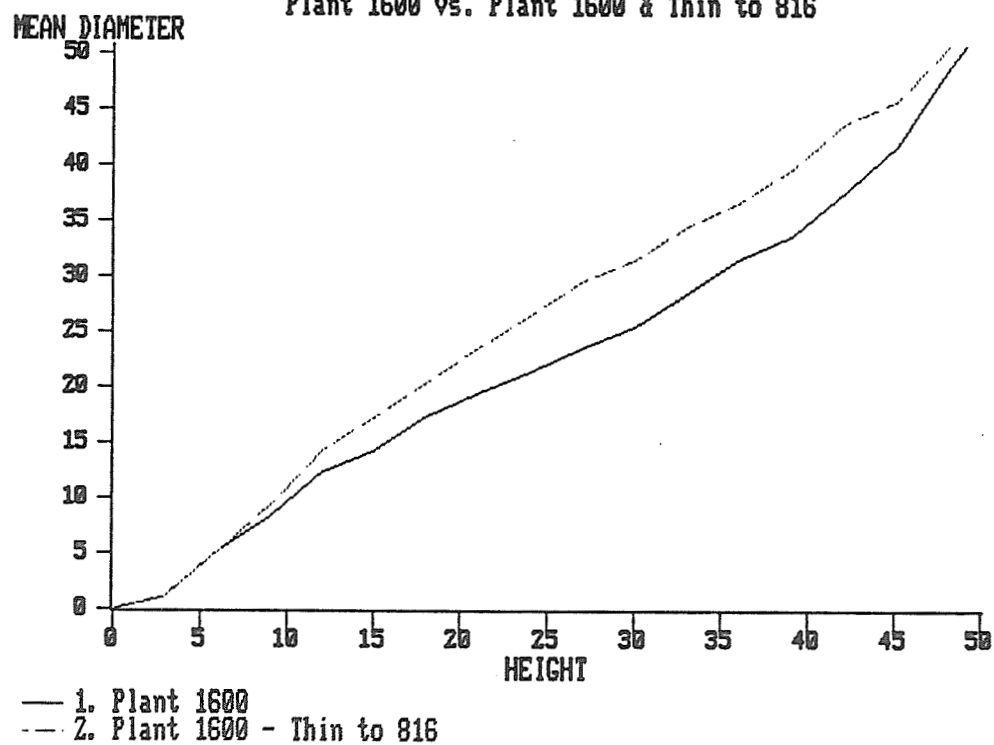
Use the *VIEW* option to examine any of the yield tables generated in the preceding examples. The contents of 1600.MSY are shown in Figure 34.

We have not looked at Operational Adjustment Factors, or "OAF's" as they are "affectionately" known. They compensate for holes in stands, pest damage and other factors that lower the productivity of stands in the operational world. Otherwise, TIPSY gives the potential yield of fully stocked stands growing in a relatively undisturbed, pest-free environment. Assume that 10% of your forested area is unproductive because of openings which are too large to be filled in by the crowns of surrounding trees, and too small to be classified as unproductive land on forest cover maps. The "holes" may be small swamps or pockets of noncommercial species such as alder. Get *1600.IN*, set *OAF 1* to *10*, *RUN* TIPSY, and compare your output (Figure 35) with the previous yield table (Figure 34). The volumes, basal area, stem count and crown cover have been reduced by 10% The mean diameter (DBHg) will remain the same because we are ignoring the small diameter response which may be experienced by trees on the edge of productive but unoccupied openings. Notice that the statistics for the 250 prime trees (12.5+) are not affected. More information is provided in the next section.

OAF 2 changes the shape of yield curves in response to agents such as root rot, that increase in intensity as stands approach maturity. These OAF's must be used with caution as they can bend the curves dramatically. Details are given in the next section of this guide.

Operational Adjustment Factors offer an excellent opportunity for testing one's DRAWing skills. Use 1600.IN as a basis for constructing a graph of *MERCH VOLUME (17.5+)* over *AGE* up to a maximum of 150 years in steps of 10 years. Display a family of 6 curves in which OAF 1 ranges from 0 to 50% in steps of 10. If you have the necessary energy, patience and time, prepare another graph with a comparable set of curves for OAF 2 concerns! You will have an opportunity to check your graphs in a later section of this guide.

Congratulations! You now know just about everything there is to know about the mechanics of using TIPSY. The sections which follow examine specialized topics in greater depth.

Figure 34

```
PRODUCT : Managed Stand Yield Summary      SOURCE  : TASS v2.05.00 May 1/92
AGENCY  : MOF Research Branch              VERSION : TIPSY V2.0 Beta
PROJECT : Plant 1600                       DATE    : Jul 08/92; 09:24:11

SPECIES : Coastal Douglas-fir              SITE    : 25 m @ bh age 50
REGEN   : Planted                          DELAY   :  0 years
DENSITY : 1600 trees/ha
TREAT.  : Untreated                        FILE    : 1600.MSY

OAFs 1&2:   0.00%    0.00%   (Operational Adjustment Factors)
```

Cumulative production

Tot	Volume (m3/ha)									MEAN	STEM		250 Prime	12.5+	
Age	Gross	Total		Merchantable					BA	DBHg	CNT	CC	MRCH	DBHg	LC
yrs	0.0	0.0	7.5	12.5	17.5	22.5	27.5	32.5	(m2)	(cm)	/ha	(%)	Vol.	(cm)	(%)
0	0	0	0	0	0	0	0	0	0	0.0	1600	0	0	0.0	0
20	18	17	12	0	0	0	0	0	6	7.3	1455	80	0	7.3	38
40	223	221	221	184	137	42	4	0	33	17.4	1404	100	67	23.1	57
60	430	427	427	385	354	285	178	75	51	22.2	1328	100	169	31.6	45
80	618	610	610	566	538	483	404	302	65	26.0	1219	100	290	38.5	41
100	759	740	740	697	675	624	557	474	72	28.9	1101	100	395	43.0	39

More ---

Figure 35

```
PRODUCT : Managed Stand Yield Summary      SOURCE  : TASS v2.05.00 May 1/92
AGENCY  : MOF Research Branch              VERSION : TIPSY V2.0 Beta
PROJECT : Plant 1600                       DATE    : Jun 22/92; 13:22:24

SPECIES : Coastal Douglas-fir              SITE    : 25 m @ bh age 50
REGEN   : Planted                          DELAY   :  0 years
DENSITY : 1600 trees/ha
TREAT.  : Untreated                        FILE    : 1600.MSY

OAFs 1&2:  10.00%    0.00%   (Operational Adjustment Factors)
```

Cumulative production

Tot	Volume (m3/ha)									MEAN	STEM		250 Prime	12.5+	
Age	Gross	Total		Merchantable					BA	DBHg	CNT	CC	MRCH	DBHg	LC
yrs	0.0	0.0	7.5	12.5	17.5	22.5	27.5	32.5	(m2)	(cm)	/ha	(%)	Vol.	(cm)	(%)
0	0	0	0	0	0	0	0	0	0	0.0	1440	0	0	0.0	0
20	16	15	11	0	0	0	0	0	5	7.3	1310	72	0	7.3	38
40	201	199	198	166	123	38	4	0	30	17.4	1264	90	67	23.1	57
60	387	384	384	346	319	256	160	67	46	22.2	1195	90	169	31.6	45
80	557	549	549	510	485	434	364	272	58	26.0	1098	90	290	38.5	41
100	684	666	666	627	607	561	501	427	65	28.9	991	90	395	43.0	39

More ---

OPERATIONAL YIELDS

The yield tables generated by TASS for use in TIPSY conform to the growth relationships observed in research plots established by the Ministry and other agencies. Most of the 11,000 plots in our growth and yield database are situated in fully-stocked, even-aged stands. The regeneration densities were generally high because most stands were established naturally, or by planting when 1.8-m (6') spacing (3,000 trees/ha) was common. The Forest Productivity plots (E.P. 703), for example, are our most valuable source of information for fully stocked, natural stands of coastal Douglas-fir and hemlock. However, stands having originated over a range of densities are represented in our database. Plantation density trials, ranging from 1- to 5-m spacing, are of particular value. These include the Species and Spacing Trials (E.P. 571) and "half-acre" plots from the UBC Research Forest. In the past, most research plots were located on uniform sites in forests with little or no evidence of pest activity. They were most likely abandoned if disturbed by any agent which lowered their productivity. Consequently, TASS and TIPSY report the **potential** yield of a specific site, species and management regime.

Less than the potential yield will be achieved operationally over large areas if irregular stocking, pests, soil disturbance, etc. reduce productivity. TIPSY can alter the magnitude and shape of the base yield curves by means of Operational Adjustment Factors. OAF 1 reduces the magnitude of the yield curve by a specified percentage, whereas the impact of OAF 2 accelerates with age, thus changing both the shape and magnitude of the curves. OAF's can also compensate for losses due to decay, waste and breakage. Details of OAF's 1 and 2 are provided in the following sections. Note that the biological explanations of each OAF are not intended to be at all rigorous.

OAF 1: Unproductive Areas (holes)

Small openings in young stands are of little concern if they will be occupied as the crowns expand. However, larger holes created by rock outcrops, brush, etc. will certainly reduce the productivity. Note that any opening of two or more hectares is recognized as a separate type on forest cover maps prepared by the Ministry of Forests. Consequently, OAF 1's account for holes ranging from the area covered by the crown of a single tree up to two hectares. OAF 1 reduces the potential volume, basal area, number of trees and crown cover by the specified percentage while leaving average diameter, and prime tree summaries unchanged. Compare the yield tables in Figures 34 and 35. They are identical except that the latter incorporates an OAF 1 of 10% Notice that the number of trees at age zero is 10% lower in Figure 35. Diameter and prime tree statistics are the same in both tables. Holes should not impair our ability to select 250 prime trees per hectare, with statistics close to those reported for stands with no holes. Large unproductive areas will have some impact on prime trees. TIPSY, however, is not capable of showing this response. A warning will be displayed if any OAF exceeds 25%.

The effect of OAF 1 reductions on a typical volume/age relationship is shown in Figure 36. OAF's from six different TIPSY runs have been overlaid to display the impact of increasingly large (0 - 50 %) reductions. Notice that the magnitude changes, but not the shape of the curve. This occurs because the curves are reduced by the same percentage across the range of ages. Figure 36 is one of the graphs which was suggested as a DRAWing exercise at the end of the tutorial.

Figure 36
OAF 1's: Plant 1600 Fdc on site 25

MERCH VOLUME (17.5+)

1. 0%
2. 10%
3. 20%
4. 30%
5. 40%
6. 50%
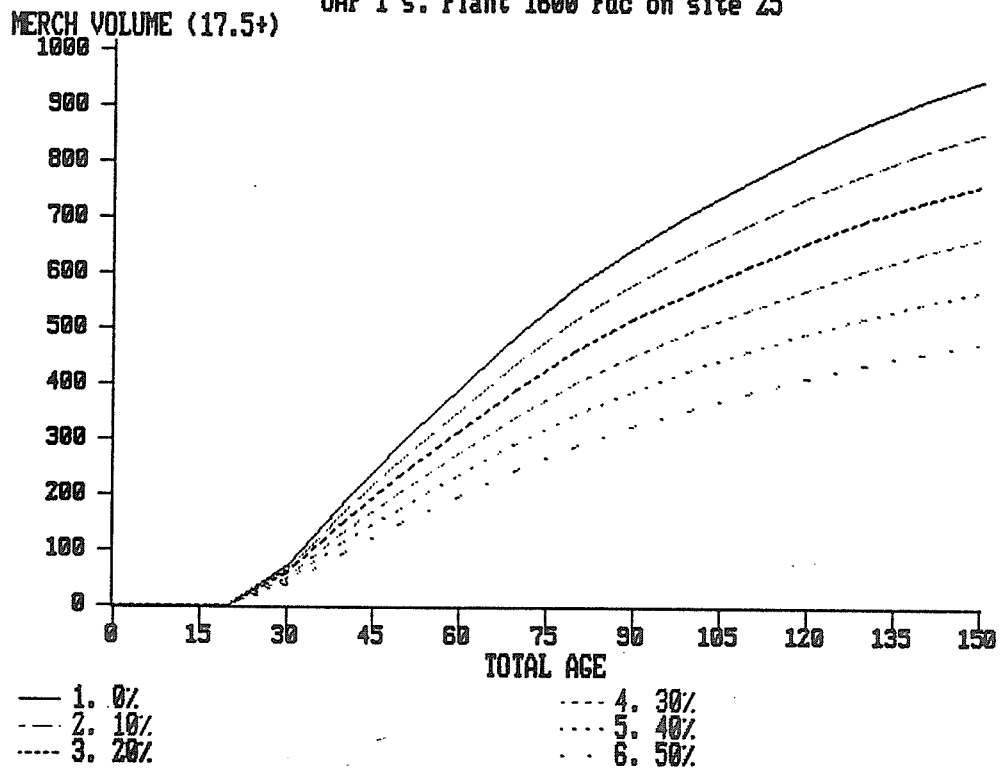
Figure 37

OAF 2's: Plant 1600 Fdc on site 25

MERCH VOLUME (17.5+)

1. 0%
2. 10%
3. 20%
4. 30%
5. 40%
6. 50%
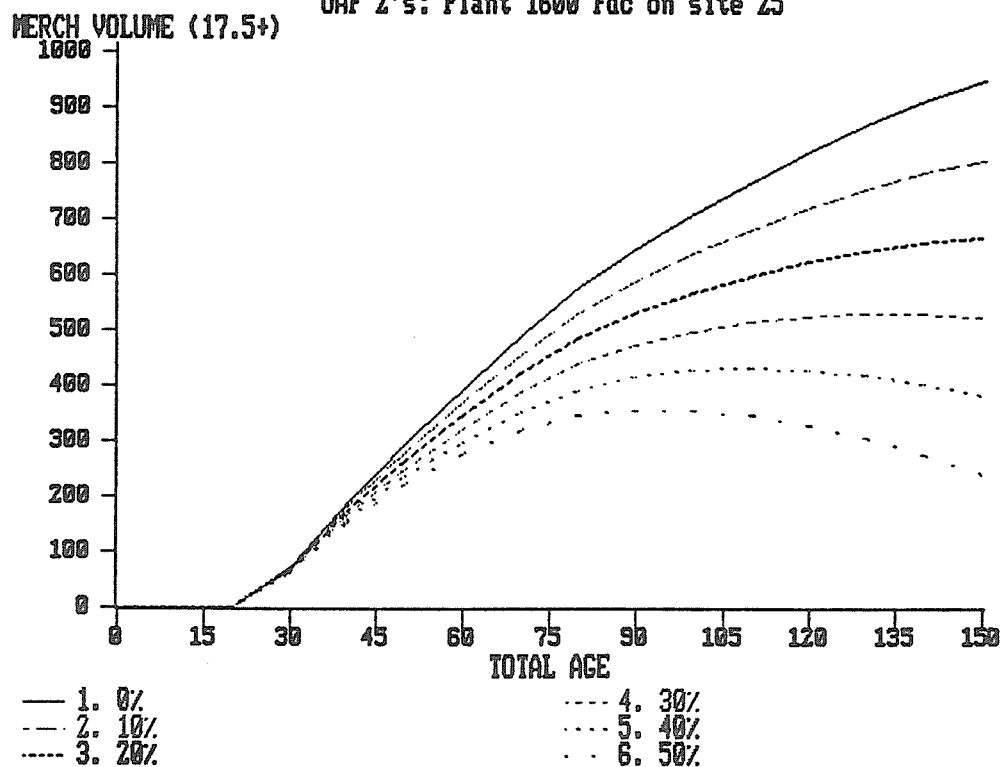
OAF 2: Losses towards Maturity (pests)

Some agents, particularly diseases, spread slowly through young stands but do not cause appreciable mortality until later in the rotation. Others, such as insects, may be more active in mature forests. The yield may track the potential curve for many years before departing in response to the onset of substantial losses. In an extreme case, the standing yield may even decline as trees die and large holes develop in the stand. The shape, as well as the magnitude, of the yield curve could change dramatically.

The implementation of OAF 2 is similar to OAF 1 except that the percentage reduction in volume starts at zero and increases with age. It passes through the prescribed value at age 100, and continues to increase indefinitely. A comparison of OAF 1 and 2, with both set at 10%, is shown below:

```
                                              ┌ index age/reductions
                                              ▼
AGE              0    10   20   30   40   50 ... 100 ... 150 years

OAF 1 (holes) 10   10   10   10   10   10 ...  10  ... 10 %
OAF 2 (pests)  0    1    2    3    4    5 ...  10  ... 15 %
```

Notice that the OAF 2 reduction increases by 0.1% (10% ÷ 100 yrs) per year, reaching 10% at age 100. OAF 1 differs in that the percentage reduction is constant across the range of ages. OAF 2, like OAF 1, reduces volume, basal area, number of trees and crown cover. Diameter and prime tree statistics are not affected.

The impact of OAF 2 is shown in Figure 37 for the same base volume/age curve and range of reductions (0 - 50%) as were displayed in Figure 36 for OAF 1. Notice that the shape changes dramatically, particularly beyond 80 years. Close examination of the early development (< 40 years) in Figures 36 and 37 reveals that a small change in magnitude is incorporated into the OAF 2 reductions.

Application of OAF's

OAF 1 can be applied alone if OAF 2 is of no concern, provided you know the proportion of growing space that will not be occupied by trees, or removed from the land base by other means as described earlier. Estimate the proportion of area permanently devoid of crown cover, and enter the percentage in the OAF 1 field. A value of 15% is recommended if no site specific information is available. An additional allowance of 4 percent has also been added in the past for decay, waste and breakage. OAF 2 reductions may be more realistic in the future since the losses generally increase with time.

OAF 2 will require considerable judgement and field experience until special studies establish reasonable values for different timber types. There are situations where a solitary OAF 2 is appropriate. Decay, waste and breakage, for example, could be deducted by a single OAF 2. However, OAF 2 can be used most effectively in concert with OAF 1.

Figure 38
Operational Adjustments: Example 1


```
TOTAL VOLUME (0.0+)
   1000
    900
    800
    700
    600
    500
    400
    300
    200
    100
      0
        0    15   30   45   60   75   90   105  120  135  150
                              TOTAL AGE
```

—— 1. No OAF's
— — 2. OAF 1 = 10
----- 3. OAF 1 = 10; OAF 2 = 10

Figure 39

Operational Adjustments: Examples 2 and 3


```
TOTAL VOLUME (0.0+)
   1000
    900
    800
    700
    600
    500
    400
    300
    200
    100
      0
        0    15   30   45   60   75   90   105  120  135  150
                              TOTAL AGE
```

—— 1. No OAF's
— — 2. OAF 1 = 9;   OAF 2 = 8
----- 3. OAF 1 = 9;   OAF 2 = 8 + 4 = 12
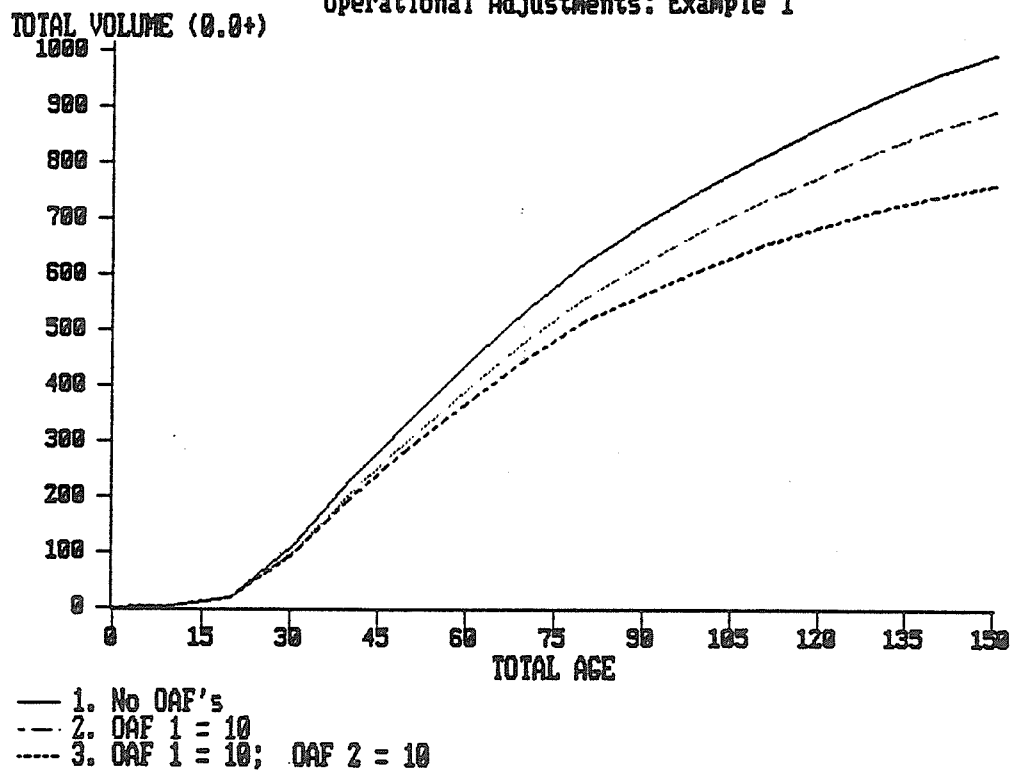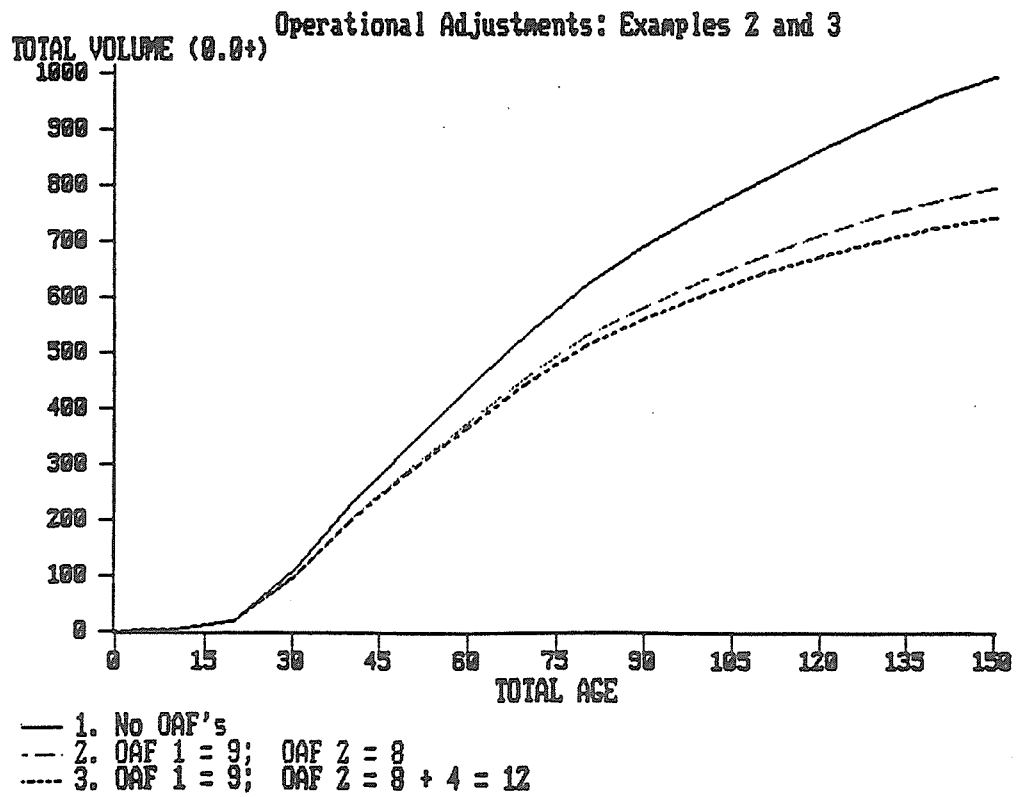
In most applications, OAF 1 and 2 will be entered in TIPSY to adjust both the magnitude and shape of a particular yield curve. Try various combinations and evaluate the results in light of your experience. Start with the example introduced above. That is,

Example 1   ┌ index age/reductions
                                                                                                            ▼

AGE	0	10	20	30	40	50 ...	100 ...	150 years
OAF 1 (holes)	10	10	10	10	10	10 ...	10 ...	10 %
OAF 2 (pests)	0	1	2	3	4	5 ...	10 ...	15 %
Sum	10	11	12	13	14	15 ...	20 ...	25 %
						▲	▲	▲

The combined reductions in volume at ages 50, 100 and 150 are 15%, 20% and 25%, respectively, as illustrated by the divergence of the lowermost curve in Figure 38.

Now assume that the harvest age of a particular stand is planned to coincide with the culmination of mean annual increment at age 75. Furthermore, you know that both OAF's are needed and a reduction of 15% at age 75 is reasonable. Try various combinations such as the one below (Figure 39) until you derive one which feels right for the situation.

Example 2   harvest age ┐   ┌ index age/reductions
                                                                        ▼   ▼

AGE	0	25	50	75	100 ...	150 years
OAF 1 (holes)	9	9	9	9	9 ...	9 %
OAF 2 (pests)	0	2	4	6	8 ...	12 %
Sum	9	11	13	15	17 ...	21 %
				▲		

└ target reduction

An allowance of 3% at age 75 might also be added to compensate for decay, waste and breakage (DWB), thus increasing the target reduction to 18% (Figure 39). That is,

Example 3   harvest age ┐   ┌ index age/reductions
                                                                        ▼   ▼

AGE	0	25	50	75	100 ...	150 years
OAF 1 (holes)	9	9	9	9	9 ...	9 %
OAF 2 (pests)	0	2	4	6	8 ...	12 %
OAF 2 (DWB)	0 ·	1	2	3	4 ...	6 % DWB
Sum	9	12	15	18	21 ...	27 %
				▲		

└ target reduction

In TIPSY, enter OAF 1 as 9, and OAF 2 as 8 + 4 = 12.

Figure 40

```
══════════════════════════════════════════════════════════════════P 2══
                          EDIT 1600T816.IN

  Project Heading
  ─────────────
  1600 - 816 based on HEIGHT

  Table Selection
  ─────────────
  Coastal Douglas-fir PLANTED at  1600.00 s/ha Thinned to    816.00 ▾

  Site Index:              25.00   Delay regeneration by:         0.00 years
  Breast-height Age:       50.00   OAF1: lower yield curves by:   0.00 %
  Top Height:              25.00   OAF2: bend curves down by:     0.00 %

  Report Yield by:                 Report Range:
  ─────────────                    ─────────────
  AGE (total)                      Start:    0.00
  HEIGHT (site)                    Stop:    60.00
                                   Step:     3.00

  MSYT Summary:  Yes ▾                        MAI Summary:   Yes ▾
                 No                                          No

════ RETURN - change ══ ESC - exit menu ════ PgUp, PgDn - select menu item ══
```

Figure 41

PRODUCT : Managed Stand Yield Summary   SOURCE : TASS v2.05.00 May 1/92
AGENCY : MOF Research Branch   VERSION : TIPSY V2.0 Beta
PROJECT : 1600 - 816 based on HEIGHT   DATE   : Jun 22/92; 14:31:39

SPECIES : Coastal Douglas-fir   SITE   : 25 m @ bh age 50
REGEN   : Planted
DENSITY : 1600 trees/ha
TREAT. : PC thinned to 816   FILE   : 1600T816.MSY

OAFs 1&2:   0.00%   0.00%   (Operational Adjustment Factors)

Cumulative production

Top Ht. (m)	Volume (m3/ha)								BA (m2)	MEAN DBHq (cm)	STEM CNT /ha	CC (%)	250 Prime12.5+		
	Gross 0.0	Total 0.0	7.5	Merchantable 12.5	17.5	22.5	27.5	32.5					MRCH Vol.	DBHq (cm)	LC (%)
0	0	0	0	0	0	0	0	0	0	0.0	1600	0	0	0.0	0
3	1	1	0	0	0	0	0	0	0	1.3	1529	18	0	0.0	0
7	7	5	0	0	0	0	0	0	2	5.4	816	42	0	0.0	0
9	20	17	17	0	0	0	0	0	6	9.6	796	76	0	13.2	68
12	57	54	54	38	4	0	0	0	13	14.3	783	93	20	16.6	70
15	103	99	99	81	54	4	0	0	19	17.4	779	98	40	20.4	70
18	178	174	174	152	141	72	9	0	27	20.9	778	100	73	24.7	63
21	256	253	253	228	221	175	71	11	34	23.6	777	100	113	28.5	55
24	343	340	340	312	306	273	194	68	42	26.3	772	100	160	32.2	49
27	456	453	453	422	416	392	331	218	51	29.1	768	100	230	36.5	44
30	582	578	578	544	539	516	467	393	60	31.8	756	100	315	40.7	41
33	701	695	695	659	654	632	589	525	68	34.3	739	100	401	44.3	39
36	832	823	823	785	782	761	723	666	76	36.8	715	100	503	48.0	36
39	970	953	953	913	911	894	858	807	83	39.6	674	100	616	51.5	35
42	1108	1075	1075	1034	1034	1025	995	951	89	43.0	611	100	733	54.7	33
45	1253	1208	1208	1166	1166	1161	1135	1094	95	45.9	575	100	861	57.8	32
48	1417	1324	1324	1283	1283	1282	1271	1245	98	50.9	483	100	1009	61.0	30
51	1588	1435	1435	1395	1395	1394	1391	1380	100	56.1	406	100	1169	64.1	29
54	1768	1547	1547	1508	1508	1508	1508	1507	102	61.7	342	100	1340	67.2	28
57	1941	1660	1660	1621	1621	1621	1621	1621	105	66.0	307	100	1506	69.9	27
60	2098	1735	1735	1697	1697	1697	1697	1697	105	70.5	269	100	1657	72.1	26

End ---

TIPSY'S DATABASE OF YIELD TABLES

TIPSY's database consists of about 440 yield tables (64 per species) generated by TASS. A complete listing of the database is given in *APPENDIX 8*. The first few lines are reproduced below:

Initial establishment				Post thinning			
Density (trees/ha)	Spacing (m)			Spacing (m)			
		none	1.5	2.5	3.5	4.5	5.5
10,000	1.0	n[1]	n	n	n	n	n
4,444	1.5	np[2]		np	np	np	np
2,500 ←	2.0	np		np	np	np	np
1,600 ←	2.5	np			np ◄	np	np
1,111	3.0	np			np	np	np
816	3.5	np				np	np
:	:	:				:	:

[1] Naturally regenerated stands only
[2] Natural and planted stands

Any table in the database can be viewed via TIPSY. Let's look at the table for Douglas-fir which was planted with 1600 trees and later thinned to 816 trees (denoted by "◄" above). Retrieve your *1600T816.IN* file which is set up for *Coastal Douglas-fir PLANTED at 1600.00 s/ha Thinned to 816.00*. Change the *Project Heading* to something unique such as *1600 - 816 based on HEIGHT*. Now edit the file to produce a table based on *HEIGHT* rather than *AGE*. Lastly, change the *Stop:* and *Step:* under *Report Range* to *60.00* and *3.00*, respectively (Figure 40).

RUN this input file without saving it and *VIEW* the results. The table should be identical to the printed output in Figure 41. This is one of the many tables in TIPSY's database. Notice that top height is displayed in the left-hand column in place of age. All tables for coastal species in TIPSY's database can be reproduced by changing the species, regeneration method, initial density and treatment density. The same procedure applies to interior species except the step should be changed from 3 to 2 m, because the yield tables in the database increase in increments of 3 and 2m for coastal and interior species, respectively.

The table in Figure 41 displays yield data for a range of heights. This is only of interest if you want to know the yield of your stands when they reach a particular top height, regardless of age or site. Site information and regeneration delay are irrelevant when MSYT summaries are based on height. However, they do affect MAI Summaries, which you can request independently or in combination with MSYT summaries.

Figure 42

```
PRODUCT  : Mean Annual Increment Summary        SOURCE   : TASS v2.05.00 May 1/92
AGENCY   : MOF Research Branch                   VERSION  : TIPSY V2.0 Beta
PROJECT  : 1600 - 816 based on HEIGHT            DATE     : Jul 08/92; 09:33:42

SPECIES  : Coastal Douglas-fir                   SITE     : 25 m @ bh age 50
REGEN    : Planted
DENSITY  : 1600 trees/ha
TREAT.   : PC thinned to 816                     FILE     : 1600T816.MAI

OAFs 1&2:       0.00%     0.00%                   UTILIZ   : Merchantable   12.5+
MAX MAI  :    6.9  m3/ha @     95 years
```

Tot Age (Yrs)	Top Ht (m)	Vol /ha (m3)	MAI /ha (m3)
0.0	0.0	0	0.0
12.3	3.0	0	0.0
17.3	6.0	0	0.0
22.1	9.0	0	0.0
27.3	12.0	38	1.4
33.0	15.0	81	2.5
39.5	18.0	152	3.8
47.0	21.0	228	4.8
55.8	24.0	312	5.6
66.4	27.0	422	6.4
79.3	30.0	544	6.9
95.4	33.0	659	6.9
115.9	36.0	785	6.8
143.0	39.0	913	6.4
180.0	42.0	1034	5.7
233.2	45.0	1166	5.0
??????	48.0	1283	---
??????	51.0	1395	---
??????	54.0	1508	---
??????	57.0	1621	---
??????	60.0	1697	---

End ---

Figure 43

DENSITY : 2500 trees/ha

Top Ht. (m)	Volume (m3/ha)								BA (m2)	MEAN DBHg (cm)	STEM CNT /ha	CC (%)	250 Prime12.5+		
	Gross 0.0	Total 0.0	7.5	12.5	Merchantable 17.5	22.5	27.5	32.5					MRCH Vol.	DBHg (cm)	LC (%)
0	0	0	0	0	0	0	0	0	0	0.0	2500	0	0	0.0	0
9	38	38	32	1	0	0	0	0	12	8.2	2249	97	1	13.0	68
18	254	252	250	198	127	32	1	0	38	15.0	2147	100	65	22.6	55
27	537	526	525	473	423	351	265	141	60	21.4	1658	100	213	34.1	43
36	913	860	860	814	785	730	677	608	79	29.7	1136	100	484	45.9	37
45	1340	1205	1205	1163	1159	1136	1095	1046	92	41.1	693	100	843	56.0	32

DENSITY : 2050 trees/ha

Top Ht. (m)	Volume (m3/ha)								BA (m2)	MEAN DBHg (cm)	STEM CNT /ha	CC (%)	250 Prime12.5+		
	Gross 0.0	Total 0.0	7.5	12.5	Merchantable 17.5	22.5	27.5	32.5					MRCH Vol.	DBHg (cm)	LC (%)
0	0	0	0	0	0	0	0	0	0	0.0	2050	0	0	0.0	0
9	32	32	27	1	0	0	0	0	10	8.4	1844	95	1	13.0	68
18	236	234	233	189	129	34	2	0	35	15.9	1776	100	65	22.8	56
27	515	508	507	460	420	353	264	137	58	22.4	1477	100	210	34.1	43
36	886	844	844	800	777	725	667	594	78	30.4	1075	100	478	45.9	38
45	1310	1190	1190	1148	1145	1125	1082	1031	92	41.5	678	100	838	56.1	33

DENSITY : 1600 trees/ha

Top Ht. (m)	Volume (m3/ha)								BA (m2)	MEAN DBHg (cm)	STEM CNT /ha	CC (%)	250 Prime12.5+		
	Gross 0.0	Total 0.0	7.5	12.5	Merchantable 17.5	22.5	27.5	32.5					MRCH Vol.	DBHg (cm)	LC (%)
0	0	0	0	0	0	0	0	0	0	0.0	1600	0	0	0.0	0
9	26	25	22	0	0	0	0	0	9	8.7	1439	93	0	13.0	68
18	218	216	215	179	131	36	2	0	33	17.3	1405	100	65	22.9	57
27	493	489	489	446	416	355	263	133	56	23.5	1295	100	207	34.1	43
36	858	828	828	785	768	720	657	579	77	31.2	1013	100	472	45.9	38
45	1279	1174	1174	1133	1131	1114	1069	1015	92	41.9	663	100	833	56.2	33

As an exercise, have TIPSY generate the MAI Summary which corresponds to the MSYT summary in Figure 41. Select the *Yes* option for *MAI Summary*, direct the output to *1600T816.MAI*, limit the output to *12.5+*, and cancel the *MSYT Summary*. Ages for MAI determination will be calculated from the sequence of heights, specified under *Report Range*, by means of the site index and the corresponding height-age curve. Next, *RUN* this file and *VIEW* the MAI Summary (Figure 42) which is based on equal increments of height (*0.0, 3.0, 6.0, 9.0 ... 60.0*). Note that ages corresponding to these heights on site 25 are shown in the left-hand column. Ages in these tables will also reflect the regeneration delay if specified earlier in the input file. The calculation of MAI terminates at or before breast-height age 300, which is the upper limit of the height-age curves.

What happens when you request a height-based table for a stand planted with 2000 trees? Since it is not in the database, TIPSY will simply interpolate between the entries in the yield tables for stands planted with 2500 and 1600 trees (denoted by "←" in the preceding table). Recall *FIRST.IN*, change *AGE* to *HEIGHT* in the *Report Yield by:* field and cancel the MAI Summary. Submit runs with initial densities of 2500, 2050 and 1600, based on height in 9-m steps. Values in the table for 2050 will fall exactly midway between those in the other tables (Figure 43), except for diameter (DBHg) which is calculated from number of trees and basal area to maintain consistency, i.e. the diameter of the tree of average basal area (see *Glossary*).

What happens when you request a table based on age for a particular stand of a known site index? TIPSY will convert sequences of ages to height with the help of the site index and associated height-age curve for the species. These curves are also in the database. TIPSY will then recall the nearest tables in terms of density, interpolate over the range of heights in each table to generate the proper height sequences, and finally interpolate between the two customized tables to localize the yield table for initial and/or precommercial thinning density. Remember that yield tables are conventionally based on age rather than height. The latter is really an intermediate step. The construction and application of managed stand yield tables are described by *Mitchell and Cameron (1985)*.

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APPENDICES

APPENDIX 1. What's new in TIPSY 2.0ß?

1.   The database of yield tables is new, and has been expanded to include four coastal species and three interior species. The coastal species are Douglas-fir, western hemlock, western redcedar and Sitka spruce. Lodgepole pine, white spruce and Douglas-fir are the available interior species.

2.   The EDIT screen has been reorganized and simplified.   Species, regeneration method, initial density and thinning density are grouped together, and valid ranges are now displayed and enforced for initial and precommercial thinning density.

3.   The volume and diameter adjustments have been replaced by two Operational Adjustment Factors (OAF's) which alter the magnitude and shape of the yield curves.

4.   The interpolation option, which was not functional in the earlier version, has been removed.

5.   An option for printing yield tables has been added to the main menu. The user also has a choice of the ASCII or enhanced IBM box characters for tabular presentations.

6.   The user can now identify a variable in the yield tables, and have TIPSY draw its relationship to age or height on the screen. You can overlay curves from up to six different yield tables.

7.   The GET, SAVE, VIEW and LIST menus have been modified to improve their utility.

8.   A simplified installation option has been added.

9.   TIPSY can be executed from the Microsoft WINDOWS environment as a DOS application.

10.   The database supplied on a floppy diskette which comes with this manual is now compressed. The system can no longer be copied to your computer without using the install program.

11.   A hard disk drive is now required. The database is too large to allow the user to operate the system from a floppy diskette.

APPENDIX 2. TIPSY and VDYP

TIPSY and VDYP (Variable Density Yield Prediction system) are models constructed by Research and Inventory Branches to address the yield of managed and natural stands, respectively. The ministry is coordinating the development of these tools for joint use in forest-level planning. They are expected to be released as a package in the coming year. Both systems will contribute to timber supply analyses and harvest scheduling of Tree Farm Licences and Timber Supply Areas. TIPSY can also evaluate silvicultural treatments, and address other stand-level planning options.

Forest-level planning

Since VDYP is based on randomly located inventory plots, its yields incorporate the full range of stand conditions encountered in naturally regenerated forests. Consequently, VDYP predicts the average yield of naturally regenerated forests that have not been treated. This type of information is needed for forest-level planning.

TIPSY, in contrast, is based on growth trends observed for up to 70 years in fully-stocked research plots growing in a relatively pest-free environment. The yields are expected to be very close to the potential of a specific site, species and management regime. These yields are generally not attainable under operational conditions. However, they are the only source of data for managed stands subjected to various silvicultural treatments. We can predict the yield of our best managed stands with reasonable confidence. However, the reduction necessary to approximate the yield of the average managed stand is not known. Our best estimate suggests that the productivity of the average managed stand will be about 15% below the unadjusted yields generated by TIPSY. For forest planning purposes, we recommend that yields be reduced by 15% unless there is strong evidence that local conditions warrant a different value. The determination and application of Operational Adjustment Factors (OAF's) are discussed on page 45.

Stand-level planning

The application of TIPSY and VDYP to managed and natural forests, respectively, is meaningful at the forest planning level of resolution. However, yields from TIPSY and VDYP are not comparable at the stand level because the databases and models are quite different. It is tempting to compare the curves for natural stands generated by TIPSY and VDYP. A casual visual comparison shows that VDYP produces approximately 75% of the yield of TIPSY for roughly similar conditions. This implies that the productivity of unmanaged stands of natural origin is about 25% below the potential of the site. More detailed comparisons are not warranted. Yield curves for untreated natural stands are included in TIPSY for the purpose of evaluating response to treatments such as precommercial thinning.

TIPSY yield tables include total and merchantable volumes, basal area, diameter, number of trees, mean annual increment, and statistics for the largest 250 "prime" trees. This information is provided to forest managers who need to evaluate the merit of silvicultural treatments in terms of yield and harvest age. For example, what initial plantation density will produce an average diameter of 30 cm at a harvest age which will coincide with the culmination of mean annual increment?

APPENDIX 3. System Requirements

TIPSY will run under the Disk Operating System (DOS 3.1 or later) on any IBM computer or clone equipped with either a 5.25" or 3.5" floppy disk drive (please specify size and density when ordering TIPSY) and a hard drive. A colour monitor and printer are highly desirable.

Disk Operating System (DOS)

Microsoft DOS 5.0 is the preferred operating environment, although TIPSY will run under DOS 3.1 or later with only minor exceptions. Refer to the *Trouble Shooting* section, *APPENDIX 12,* if your version of DOS is earlier than 3.1.

Floppy disk drives

Please ensure that the diskette(s) enclosed in the mailer attached to the back cover of this guide matches one of your floppy disk drives in terms of size and capacity. That is,

Option	Your floppy disk drive	Diskette required
1.	3.5"/1.44Mb	1 - 3.5" diskette formatted for 1.44 Mb
2.	3.5"/720Kb	1 - 3.5" diskette formatted for 720 Kb
3.	5.25"/1.2Mb	1 - 5.25" diskette formatted for 1.2 Mb
4.	5.25"/360Kb	2 - 5.25" diskettes formatted for 360 Kb

If you receive the wrong option, have someone copy it to a diskette of the correct size and density (options 1 - 3 only), or request a replacement from our User Support service. Option 4, available by special request for older systems, should not be copied/installed using other drives.

Monitor

TIPSY is designed for colour monitors, but should also work on monochrome systems if the brightness and contrast are adjusted. Laptops, in particular, may have to be reset through software supplied with the computer. See *APPENDIX 5, Operation,* for more information about using monochrome monitors. Please call User Support if you need assistance.

Printer

TIPSY can send yield tables in ASCII format to any printer. Graphs can only be directed to your printer if it is supported by the version of DOS under which TIPSY is operated.

APPENDIX 4. Installation

Simply turn your computer on and allow the Disk Operating System (DOS) to boot normally.
Remove the TIPSY diskette from the envelope attached to the inside of the back cover, insert it
in the appropriate drive (A or B), close the door, and select one of the two options below
(preferably the first). Enter the commands following the prompt on your screen (e.g. C:\>).

Install TIPSY in C:\TIPSY directory (Option 1): This option should be selected by most
users including those who are familiar with neither TIPSY nor DOS.

Set the default floppy drive to A: (or B:), and type the installation command. You may use
uppercase letters, as illustrated, or lower case. Note that the "Enter" key is symbolized by
[◄—┘] in the following example:

A: [◄—┘]   Default floppy drive (A: or B:)

INSTALL [◄—┘]   The INSTALL routine on the diskette will now ask you to confirm that it
                                 should proceed to create a subdirectory called C:\TIPSY, and then copy
                                 all system files from the diskette to this location on your hard drive.
                                 Refer to *Trouble Shooting (APPENDIX 12)* if you get a *Not Ready* error.

[◄—┘]   Press the Enter key to confirm and continue. Monitor the progress
                                 reported on the screen <u>watching for a *disk full* message</u>, e.g. *Skipped
                                 YIELDTBL.DBF: disk full*. If it appears, ignore the *TIPSY installation
                                 complete* message, and delete or move unnecessary files on C: drive until
                                 you have about 1.8 Mb of space free. Now restart the installation
                                 procedure.

                                 NOTE: a <u>warning message</u> will appear if the *Directory C:\TIPSY already
                                 exists*. If so, select one of the two responses below:

            [◄—┘]   **Response 1:** Press the Enter key if you want to proceed
                                     with the installation. Keep in mind that any previously
                                     installed version of TIPSY will be overwritten.

            [Ctrl]-[C]   **Response 2:** Press [Ctrl] and [C] to prevent the
                                     installation of TIPSY. That is, depress the Control key and
                                     do not release it until the "C" key has been pressed. Now
                                     press ...

            Y   in response to *Terminate batch job (Y/N)?*, and start over
                                     again using *Option 2*.

C: [◄—┘]   Change the default drive back to the hard disk, skip past *Option 2* which
                                 follows, and continue at the heading *Remove the floppy*.

Install TIPSY in a specified directory (Option 2): Set the default floppy drive to A: (or B:), type the installation command followed by the target drive on the hard disk (usually C:), and the name of the directory on which TIPSY is to be installed.

A: [◄—┘]
Default floppy drive (A: or B:)

INSTALL C:\YT [◄—┘]
The INSTALL routine creates a subdirectory which you name (e.g. YT for yield tables), decompresses all system files and copies them from the diskette to drive C. Any subdirectory/path, may be specified, e.g.

    C:\TIPSY (most common: see *Option 1*)
    D:\TIPSY (different drive if available)
    C:\USR\SEG\TIPSY (different directory)

Refer to *Trouble Shooting (APPENDIX 12)* if you get a *Not Ready* error. Monitor the progress reported on the screen watching for a *disk full* message, e.g. *Skipped YIELDTBL.DBF: disk full.* If it appears, ignore the *TIPSY installation complete* message, and delete or move unnecessary files on this directory until you have about 1.8 Mb of space free. Now restart the installation procedure.

The warning described with *Option 1* will be displayed if you request an existing directory. Respond with [◄—┘] or [Ctrl]-[C].

Other information will be displayed ending with *TIPSY installation complete.*

C: [◄—┘]
Change the default drive back to the hard disk.

Remove the floppy: Remove the diskette from Drive A (or B) and store it in a safe place. It will provide a backup in the event your files are lost or damaged. This diskette also contains the installation and decompression (INSTALL.BAT, DATABASE.LZH, LHA.EXE) files which were not transferred to your computer.

Check the success of the installation: It is comforting to know that TIPSY was actually loaded as planned. The following set of commands will list the files installed on your system.

C: [◄─┘]   Go to the appropriate drive on your hard disk, if necessary.

CD \TIPSY [◄─┘]   Change to the TIPSY directory (from Option 1).
                                            If you used Option 2, substitute the name of the target
                                            directory e.g. CD \YT.

DIR [◄─┘]   List all files in the directory.

The following files and related information should be displayed (volume, directory, file sizes, order, dates and times may differ):

Volume in drive C has no label
Directory of C:\TIPSY

.		<DIR>		2-04-91	1:22p
..		<DIR>		2-04-91	1:22p
TIPSY	EXE		244930	7-07-92	4:01p
LTYPE	EXE		7845	4-27-90	9:55a
YIELDTBL	DBF		1468160	5-19-92	3:57p
SPECTRT	DBF		35840	5-19-92	3:57p
DEFAULT	IN		2028	6-08-91	1:28p
DEFAULT	BAK		2028	6-08-91	1:33p

Remove outdated versions of TIPSY: To avoid confusion, delete all previous versions of TIPSY stored in other directories. It is convenient if TIPSY is always installed in the same directory because the installation procedure overwrites the previous copy.

Running TIPSY from WINDOWS: The version of TIPSY now installed on your system can be executed from the Microsoft WINDOWS environment as a DOS application. Consult your WINDOWS documentation for installation information.

Printing yield curves: TIPSY does not support graphics printers. However, users who wish to direct graphs of yield curves from the screen to their printer via the Print Screen command can do so indirectly by loading a DOS program into memory. The command must conform to your printer and version of DOS. If you have Microsoft DOS 5.0 (MS-DOS 5.0) and a Hewlett-Packard Laserjet II printer, for example, add the command, GRAPHICS laserjetii, to your AUTOEXEC.BAT file, or enter it before executing TIPSY. Consult the reference section of your DOS manual to determine if your printer is recognized. MS-DOS 5.0 supports most IBM and Hewlett-Packard printers, and compatible machines. Try "GRAPHICS graphics" if you have a dot matrix printer. Earlier versions of PC DOS from IBM support only IBM printers.

The installation of TIPSY is now complete!: Return to *Page 7* to learn more about TIPSY. Experienced users may prefer to proceed to operate the system as described in *APPENDIX 5* and *APPENDIX 6.*

APPENDIX 5. Operation

To activate TIPSY from DOS, enter the commands listed below (note that the "Enter" key is symbolized by [◄—┘]):

C: [◄—┘]   Go to the drive (C:, D:, etc.) with TIPSY's directory.

CD \TIPSY [◄—┘]   Change into the subdirectory in which TIPSY was installed
                                     e.g. \TIPSY (from Option 1), \YT or other directory specified
                                     in Option 2.

TIPSY [◄—┘]   Invoke the program.

                                     If you have a monochrome (black and white) monitor, and
                                     find that the text is not displayed properly, try:

[Ctrl]-[Break]   to exit TIPSY, and

TIPSY -b [◄—┘]   to invoke the system with a parameter (-b) that tells TIPSY to
                                     adjust to a monochrome unit. Normally, TIPSY can sense the
                                     type of monitor attached to your computer.

                                     The "Opening Screen" of TIPSY should appear. Press any key
                                     to see the main menu.

You are now ready to generate yield tables, or return to *Page 7* to learn more about TIPSY's capabilities. Note that the operation of the system may differ if a specialized setup procedure is employed *(APPENDIX 6)*.

APPENDIX 6. Setup Procedures

The installation program configures TIPSY such that the system files (program, database and default.in), and all input and output files generated by the user are stored on the same directory. However, TIPSY can be configured differently for the convenience of experienced users who encounter specialized problems.

Operate TIPSY from another directory: The management of input and output files may be cumbersome if too many are saved or generated. For convenience, add the location of TIPSY's system files to your PATH, and move to the directory in which your input and output files should reside. Copy DEFAULT.IN, DEFAULT.BAK, and any customized input files to your working directory. Otherwise, you will have to start with an empty EDIT screen (see *EDIT screen is empty* under *Trouble Shooting* in *APPENDIX 12*).

Install TIPSY's database on a different directory: This enhancement will help those who may want to use or test an updated version of TIPSY's database before deleting the old one. Assume that TIPSY was installed some time ago, and you have just received a new version of the database. Move into your parent directory (e.g., C:\TIPSY), create a subdirectory for the data (e.g., WORK), and copy the updated database into this new location. Whenever you want to access the new database from within TIPSY, move down the *TIPSY Main Menu* and enter the special *CHANGE the System Database directory* option at the bottom of the screen. Now specify the subdirectory into which you copied the new database, e.g. \TIPSY\WORK, and return to the main menu. TIPSY will use the new database. However, you can switch to the old database from within TIPSY if you *CHANGE the System Database directory* back to the original location, e.g. \TIPSY.

APPENDIX 7. User Support

The Research Branch can provide limited support to new users. Requests for assistance or copies of TIPSY will be handled by our TIPSY Coordinator who can be reached by:

Email:	SGROUT for ALL-IN-1 or PROFS users
	INTERNET: SGROUT@GALAXY.GOV.BC.CA for others
Fax:	604 387-8197
Telephone:	604 387-6718
Mail:	Attn: S. Grout, TIPSY Coordinator
	Forest Productivity and
	Decision Support Section
	Research Branch
	B. C. Ministry of Forests
	506, 1175 Douglas St.
	Victoria, B.C. V8W 3E7
Stopping at:	Suite 506, 1175 Douglas Street
	(enter off View Street)

If you have problems with this test version of TIPSY, please help us to assist you by completing the following steps:

1. Review what you are attempting to accomplish.

2. Repeat the run and reproduce the problem.

3. Carefully record each step and symptom.

4. Contact User Support if the problem persists.

Someone will either tell you how to avoid the problem, or correct the coding in TIPSY and send you a revised copy as soon as possible.

If you discover ways in which TIPSY can be improved, please let us know. We will attempt to incorporate your ideas or recommendations in a future version of the program.

A mailing list of all users is maintained so that updates and supporting information can be distributed as required. Please send us the *TIPSY Registration Form* at the end of this guide if you are not registered and would like to be added to the mailing list.

APPENDIX 8. Database

TIPSY relies on a database of managed stand yield tables generated by TASS, and "site curves" (height/age/site index regressions) compiled by *Thrower and Nussbaum (1991)*, and *Thrower et al (1991)*. These curves have been developed or adopted by the Ministry of Forests. There are 9 untreated and 20 thinned yield tables for each species planted, and 10 untreated and 25 thinned tables for each species regenerated naturally. The yield tables are tabulated below followed by information (source and years to breast height) about the site curves by species.

TASS Yield Tables

| Initial establishment | | | | Post thinning | | | |
| Density (trees/ha) | Spacing (m) | | | Spacing (m) | | | |
		none	1.5	2.5	3.5	4.5	5.5
10,000	1.0	n[1]	n	n	n	n	n
4,444	1.5	np[2]		np	np	np	np
2,500	2.0	np		np	np	np	np
1,600	2.5	np			np	np	np
1,111	3.0	np			np	np	np
816	3.5	np				np	np
625	4.0	np				np	np
494	4.5	np					np
400	5.0	np					np
331	5.5	np					

[1] Naturally regenerated stands only
[2] Natural and planted stands

Species	Site Curve	Source
Coastal species		
Douglas-fir	YBH = 13.25 - SI/6.096	Bruce 1981
Hemlock	YBH = 9.43 - SI/7.088	Wiley 1978
Redcedar	same as Douglas-fir	Kurucz 1985
Sitka spruce	YBH = 11.7 - SI/5.4054	Barker and Goudie 1987
Balsam	same as hemlock	same as hemlock
Interior species		
Lodgepole pine	YBH = 5.6 + 42.64/SI	modified from Goudie 1984
White spruce	YBH = 6 + 2.1578 + 110.76/SI (natural)	Goudie 1984
	2 + 2.1578 + 110.76/SI (plantation)	
Douglas-fir	YBH = 4 + 99/SI	Thrower and Goudie 1992
Hemlock/redcedar	same as coastal	same as coastal

APPENDIX 9. Available Yield Tables

This section serves as a guide to the range of yield tables available through TIPSY for each species and treatment, and opportunities for interpolating between tables in the database.

TABLE 1. Yield tables available from TIPSY

PLANTED STANDS		NATURAL REGENERATION	
Established[1]	After PCT[1]	Established[1]	After PCT[1]
Number of trees		Number of trees	
		10000]	10000^2 - 331
		9999 : 4444 }	4444^2 - 331
4444]	4444^2 - 331		
4443 : 2500 }	2500^2 - 331	4443 : 2500 }	2500^2 - 331
2499 : 1600 }	1600^2 - 331	2499 : 1600 }	1600^2 - 331
1599 : 1111 }	1111^2 - 331	1599 : 1111 }	1111^2 - 331
1110 : 816 }	816^2 - 331	1110 : 816 }	816^2 - 331
815 : 625 }	625^2 - 331	815 : 625 }	625^2 - 331
624 : 494 }	494^2 - 331	624 : 494 }	494^2 - 331
493 : 400 }	400^2 - 331	493 : 400 }	400^2 - 331
399 : 331 }	no PCT option	399 : 331 }	no PCT option

[1] input options for TIPSY
[2] actual number of trees alive before thinning will be less

APPENDIX 10. Helpful Hints

1. Plantation age and breast-height age

All tables based on age relate yield to the number of years since the trees germinated in even-aged stands, assuming no regeneration delay. The user may prefer to see reports referenced to planting age. Simply select *Age (total)* and enter the seedling age (e.g. 2 years) in the *Start:* field under *Report Range*. The age sequence displayed in the yield table (e.g. 2, 12, 22...) will still show the number of years since germination, but equates directly to the requested sequence of plantation ages (e.g. 0, 10, 20...). You may also need tables based on breast-height age. Start the age sequence with the number of years which elapse before the site trees reach a height of 1.3 m. If unknown, use the appropriate *Years to Breast Height* equation listed in *APPENDIX 8*. Coastal Douglas-fir on site 25 is estimated to take 9.15 years. That is,

Years to breast height = 13.25 - (site index)/6.096 = 13.25 - 25/6.096 = 9.15

GET 1600.IN, and set *Start:, Stop:* and *Step:* to *9.15, 100* and *20*, respectively. Running the yield table will display total ages (9, 29, 49...89) which correspond to the required breast-height ages (0, 20, 40...80). If you also specify a regeneration delay of 5 years, for example, the age sequence would shift such that age 14 is equivalent to breast-height age 0.

2. Naming output files

MSYT and MAI Summaries can be stored in separate files if different names are entered in the appropriate fields in the pop-up menus displayed in Figures 16 and 17. FIRST.MSY and FIRST.MAI could be substituted in place of FIRST.OUT. The file names must be altered in subsequent runs if you wish to save each output file. Otherwise, the files will be overwritten. Try SECOND.MSY, SECOND.MAI ...

3. Output file headers

TIPSY includes an option that suppresses header information (Figure 16) from MSYT summaries for the benefit of users who wish to have the output files serve as input files for other programs.

4. Box characters

The vertical and horizontal lines in the yield tables can be formed with standard ASCII (text) characters, or the more appealing IBM box characters. Use the latter if your printer has this feature. Older machines may generate unusual symbols or letters making it necessary to switch to the universal ASCII characters. Specifying the type of box characters in the MSYT Summary automatically assigns the same type to the MAI Summary, and vice versa.

5. Print screen

Information on the screen (e.g. EDIT screen, yield table) can be printed by pressing the Print Screen key [PrtSc]. Graphs drawn on the screen can also be sent to the printer by this method if TIPSY has been installed with the capacity to print graphs (*APPENDIX 4*, page 62).

6. Printing files outside of TIPSY

Yield tables can be printed outside of TIPSY by using the DOS PRINT command followed by the file name. For example ...

PRINT DEFAULT.OUT [◄—˩]

You will be asked for: *Name of list device[PRN]*. Press Enter [◄—˩] to send your output file to the printer. As an alternative, you can use your favourite editor or word processor to perform this task. You may have to adjust the line margins and/or font to accommodate 80 characters per line on an 8.5" page (e.g. 0.25" margins for 10 characters/inch).

7. Listing files outside of TIPSY

The DOS Command DIR [◄—˩] will list the files in the directory. The command DIR *.IN[◄—˩] will restrict the listing to input files, and DIR *.OUT [◄—˩] will recognize only output files if the first suggested naming convention is followed. However, you may prefer to recognize two types of output files as suggested earlier. In this case, use DIR *.MSY and DIR *.MAI in place of the DIR *.OUT command.

8. Report culmination of MAI to the nearest year

Mean annual increment, displayed in the MAI Summary, is reported at each age generated by the Start:, Stop:, Step: sequence. The exact age at which MAI culminates may be missed. You can, of course, determine the range of ages which bracket the largest MAI's, and rerun TIPSY in one-year steps over the restricted range of ages. It is unlikely, however, that such precision is really meaningful.

9. Identifying yield tables

TIPSY's database is updated and distributed to users whenever new growth and yield information is incorporated into TASS. Consequently, you could have two different yield tables on file apparently generated by the same set of specifications. If so, look at the SPECIES, SOURCE and VERSION displayed in the header of each table. For example:

SPECIES:	Lodgepole pine	-	references the species
SOURCE:	TASS v2.05.00	-	identifies the version of TASS and ...
	May 1/92	-	the date on which the database for a particular species (lodgepole pine) was generated
VERSION:	TIPSY V2.0 Beta	-	denotes the version of TIPSY used to produce the yield tables.

Please provide this information if you need to report the source of a particular yield table.

APPENDIX 11. TIPSY Error Messages

Most messages are self explanatory, or can be deciphered with a little thought. The following cases will illustrate the most common error messages.

1. **Invalid utilization limit:** Go into the *MAI Summary* and enter *10.0* for *Other Utilization*. The system will respond with *"Invalid Value   Press ESC"* because 10.0 is not within one of the ranges of valid numbers (0.0 - 7.5 and 12.5 - 32.5). An entry of 0.0 is possible but does not produce a separate summary. TIPSY will not let you leave the pop-up menu until you enter a valid utilization limit. Try *0.0.*

2. *Can't find (filename) to (operation):* A message such as *"Can't find FIRST.OUT to PRINT"* tells you that the file requested was not found. You may have misspelled its name or appended the wrong directory when trying to *GET, SAVE, PRINT* or *LIST* files. The same message will tell you to *Press ESC to continue.* (i.e. press *ESC*, correct the problem, and continue.)

3. *START has to be less than*
    STOP value and
    STEP can not be zero
      press ESC to continue: This error message indicates that the numbers in the *Report Range* fields are not logical. Press *ESC* to erase the error message, then try again.

4. *Warning: Prime tree information may be incorrect for large OAF's*
    This message appears if OAF 1 or OAF 2 exceeds 25%. Since TIPSY assumes that prime tree statistics don't change in response to OAF's, it is warning the user that this assumption is unreasonable if large reductions are applied.

Note: it is possible to enter values which are totally unrealistic, without creating error messages. For instance, you could enter a value of 100 in the *Delay regeneration by:* field, or a site index of 99. Check your EDIT screen carefully before running TIPSY to avoid unreasonable results.

APPENDIX 12. Trouble Shooting

1. Missing or incomplete TIPSY files

An understanding of the purpose and size of each file used by TIPSY may be helpful when trouble shooting. Missing or incomplete files may cause TIPSY to fail, display error messages, or limit the range of yield tables available. Here is a list of files which should appear in your TIPSY directory:

Program	Size (bytes)	Description
1. TIPSY.EXE	244,930	Main program
2. YIELDTBL.DBF	1,468,160	Database of yield tables
3. SPECTRT.DBF	35,840	Database of species and treatments
4. LTYPE.EXE	7,845	Program to view files
5. TIP_FILE	0	File created by TIPSY for temporary storage
6. DEFAULT.IN	2,028	Input file used by TIPSY to initiate processing
7. DEFAULT.BAK	2,028	Backup copy of DEFAULT.IN

The user can access and modify the DEFAULT. files, but not the five basic system files.

2. Not ready error ...

This error may occur when you initiate the installation of TIPSY or any other procedure that reads files from a floppy drive (A: or B:). The message usually appears as:

Not ready error reading A (or B)
Abort, Retry, Fail?

Press *[R]* to retry. If this fails, you probably ...
1. forgot to insert the floppy diskette in the correct drive. If so, insert it, and press *[R]*.
2. neglected to close the door of the drive. If so, close it and press *[R]*.
3. received a floppy diskette which is out of alignment with the drive which formatted the installation diskette. Press *[A]* to abort, then try the second drive, if you have one. You could also use another computer to copy the contents of the installation diskette to a diskette formatted by your computer.
4. need to call user support.

3. Original DEFAULT.IN file is missing

If you saved an altered copy of DEFAULT.IN by mistake, and need to recover the original version ...
GET *DEFAULT.BAK* (the backup version of DEFAULT.IN) and
SAVE it as *DEFAULT.IN*.

4. System hang-up

If the screen does not respond to the keyboard, try to break out and return to DOS via one of the following methods:

<u>Method 1</u>

[Ctrl]-[Break] [◄—┘]   (Clear Screen command, CLS, may not be displayed on the
CLS [◄—┘]   screen as you type). The DOS prompt (e.g. C:\>) will
                         appear if this method is successful.

<u>Method 2</u>

[Ctrl]-[Alt]-[Delete]   Computer should reboot and then display the DOS prompt.

<u>Method 3</u>

Switch the computer   Computer will reboot and display the DOS prompt.
off, wait 10 seconds,
and turn it back on.

5. Earlier versions of DOS

TIPSY may operate under earlier versions of DOS, with the possible exception of the *LIST all files* option (Figure 2). The system may also hang up when you *EXIT from TIPSY*, making it necessary to break out using one of the methods noted in #1 above. In the future, use [Ctrl]-[Break] to exit TIPSY.

6. EDIT screen is empty

You might go directly into the *EDIT* screen, without *GET*ting a particular input file, and find that all numeric fields display *0.00* with the exception of *Site Index* which shows *999.00*. You are apparently attempting to *EDIT DEFAULT.IN*, but the *Project Heading* is blank, and *Table Selection* contains *Coastal Douglas-fir NATURAL at 0.00 s/ha Untreated▾*. The information normally displayed is missing because TIPSY could not find DEFAULT.IN which populates the *EDIT* screen. Your DEFAULT.IN file may have been deleted/renamed accidentally, or not copied to the appropriate directory. Use one of the following procedures to recover or recreate DEFAULT.IN:

1.   Leave the *EDIT* screen and TIPSY by means of [Ctrl]-[Break]. Invoke TIPSY (*TIPSY* [◄—┘]) and use the *LIST all files* feature to search in your current directory for DEFAULT.BAK. If listed, *GET DEFAULT.BAK*, (backup file), and *SAVE* it as *DEFAULT.IN*. You may also substitute any other input file.

2.   Leave the *EDIT* screen and TIPSY by means of [Ctrl]-[Break]. Invoke TIPSY and use the *LIST all files* feature to search in other working directories for DEFAULT.IN. If you do find it, enter the *GET an input file* screen and retrieve DEFAULT.IN by changing the path in the *GET* screen. Then *SAVE* it in your current directory as *DEFAULT.IN*.

3.   Patiently reconstruct another version of DEFAULT.IN by entering the information displayed in Figure 4, or use new data more appropriate to your application. The missing cursor will appear if you press [↓], or start typing the project heading. When finished, *[Esc]* to the *TIPSY Main Menu* and *SAVE* your new file as *DEFAULT.IN*.

GLOSSARY

Basal Area (BA):	cross-sectional area outside bark (ob) at 1.3m (0.0+)
Breast Height:	1.3 m above the ground on the uphill side of the tree
Breast-Height Age:	average age (ring count) of top height trees at breast height
Crown Cover (CC):	ground area covered by tree crowns (0.0+)
Index Age:	breast-height age 50 is the reference age for site index
Inside bark (ib):	with reference to measurements recorded inside bark
Intertree distance:	average distance between trees
Live Crown % (LC):	length of crown relative to tree height

Mean Annual Increment (MAI):
  Maximum MAI:
  Culmination age:
	average annual increase in stand volume
	maximum mean annual increment
	age at which maximum MAI occurs

Mean DBHg:	diameter (ob) at breast height of tree of average basal area
Merchantable volume:	excludes a 30-cm stump, 10-cm top (ib) and trees below a specified minimum diameter
Outside bark (ob):	with reference to measurements recorded outside bark
Prime Trees (12.5+):	250 trees/ha destined to be of the largest diameter at maturity
Site Index:	top height at breast-height age 50
Stem Count:	number of living trees (0.0+)
Top Height:	average height of the 100 trees/ha of largest diameter
Total Age:	average number of years since the site trees germinated

Volume
  Gross:
  Total standing (0.0+):
  Total standing (7.5+):
  Merchantable (12.5+):
	
	total production (living, dead, thinned)
	living trees
	trees $\geq$ 7.5-cm DBH (ib)
	trees $\geq$ 12.5-cm DBH less a 30-cm stump and 10-cm top (ib)

Years to Breast Height (YBH):	years to grow from seed to breast height

INDEX

USER NOTES

TIPSY REGISTRATION FORM

This information will help us fill new orders, update
old versions of TIPSY and assess user requirements.

ADDRESS   **DATE:** _____

Name: _____

Title: _____

Organization: _____

Address: _____

City: _____ Province: _____ Postal Code _____

Phone: _____ Fax: _____ EMAIL _____

COMPUTER

Make: _____ Model: 088/086 (PC) ____ 286 (AT) ____ 386 ____ 486 ____

Other (specify) _____

Monitor: Monochrome: MDA ____ Colour: CGA ____ EGA ____ VGA ____ SVGA ____

Floppy Drives: 5.25": 360 Kb ____ 1.20 Mb ____ 3.5": 720 Kb ____ 1.44 Mb ____

Hard Drive _2Mb required_ DOS Version: _____

OTHER INFORMATION

Are you using TIPSY? ____ ; If so, which version? _____

Should we add your name to our permanent mailing list?: Yes___ No___

Comments: _____

(Please continue comments on back of this page)

Please send to: TIPSY Coordinator
                   Forest Productivity and Decision Support
                   Research Branch
                   Ministry of Forests
                   506 - 1175 Douglas St.
                   Victoria, B. C.   V8W 3E7

                   Attention: Shelley Grout   (Fax: 604 387-8197)

Comments (continued):

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